

COMPUTERWORLD

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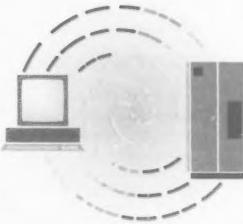
EPA acid rain project gains Computerworld Smithsonian Award nomination as PCs speed data out the door. Page 18.

SAA spurs software scuffle

BY DOUGLAS BARNEY
CW STAFF

IBM's announcement of its Officevision line of software this week will set off a scramble that may greatly blur the conventional distinctions between personal computer and mainframe software vendors.

By embracing both PCs and IBM hosts in a cooperative processing network, Officevision and the Systems Application Architecture it conforms to will change all the rules. To please customers, software vendors must now understand both architectures and expand product lines into new and unfamiliar territories. "The mainframe vendor that doesn't master coopera-



tive processing will fail, and the PC vendor will at least fail in the large corporate environment," said Rick Crandall, Comshare, Inc.'s president and chief executive officer.

The mainframe camp appears to have an early SAA lead and is expected to outnumber PC vendors at the announcement. Firms such as McCormack & Dodge Corp. and Management Science America, Inc. are expected to detail elaborate product strategies that combine host

back-end software with graphical workstation components running under Microsoft Corp. and IBM's OS/2 Presentation Manager.

PC vendors in attendance are expected mostly to sketch out products that for now only partially support the Officevision environment.

For Microsoft, the strategy is to allow third parties to connect PCs to host systems. "PC vendors understand how users think and what they like to see in an application," said Jeff Raikes, general manager of the office business unit at Microsoft. "We will not be an AS/400 or 370 developer. We will work with others who understand the host world."

Microsoft is slated to announce that its Excel spreadsheet will work with Officevision, while Lotus Development Corp. is expected to demon-

Continued on page 108

CA users win fee reprieve

BY ROBERT MORAN
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. announced last week that it will suspend for a year the implementation of its tiered pricing on products inherited from the acquisition of Applied Data Research, Inc.

In March, users began to complain that CA's switch from site licenses to tiered pricing increased their maintenance fees by as much as 50%.

With site licensing, users paid maintenance prices based on the IBM Group 30 class of processors regardless of processor size. Tiered pricing sets price levels according to the different IBM classifications. Companies running processors in IBM classifications larger than Group 30 were hit with the steepest increases.

Joseph Huber, deputy administrator at Madison Area Techni-

Continued on page 8

Fed IS execs bailing out

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Information systems executives in the federal government, hit by the double whammy of no pay raise and new ethics rules that restrict them from getting jobs with government contractors, are fleeing government service before the ethics rules take effect.

Last week, Daniel N. Capozzoli, assistant commissioner of computer services at the Internal Revenue Service, announced he will retire today, one day be-

fore the ethics legislation kicks in May 16.

Patricia A. Szervo, commissioner of the General Services Administration's Information Resources Management Service, also resigned recently, citing the new ethics law.

Capozzoli began his 28-year IRS career as a programmer and rose through the ranks to become the top executive in charge of data processing support.

An IRS spokesman confirmed that the timing of Capozzoli's resignation was related to the effective date of the ethics rules.

Continued on page 10

Second tier

Average salaries for government IS executives were lower than many of their peers, according to Computerworld's 1988 salary survey

	AVERAGE 1988 SALARY*
Manufacturing	\$87,692
Insurance	\$81,714
Wholesale/Retail	\$78,650
Government	\$75,187
Banking/Financial	\$72,144
Education	\$69,500

* Salary for the equivalent of vice-president, information systems

Netware rides into mini land

Some balk at price, but capacity scores a hit

BY PATRICIA KEEFE
CW STAFF

If MIS can swallow the \$8,000 sticker price, Novell, Inc. may have a blockbuster on its hands with Netware 386.

Users surveyed last week were champing at the bit, awaiting their chance to test the price/performance of Novell's top-of-the-line network software.

Announced last week at a flashy press conference in San Francisco, the first installment of the two-phase Netware 386 will ship in the third quarter. It has users' mouths watering in anticipation of significant enhancements in the areas of speed, memory, storage, number of users supported and size of files. However, there is some uneasiness over its cost.

But price does not have to be a stumbling block to market pen-

Know Netware

- 286 version comparison.
- Novell takes aim at the minicomputer market.

Stories page 6

etration. "The industry impression is that LANs are still toys. Netware 386 is so much like a mini in a little box. I look at it as a real-world solution, and I need it today," said Edward Wilk, network manager at WNEV-TV in Boston.

By supporting up to 250 users per server and overcoming volume and file size limitations, Netware 386 should provide much-needed relief for large database users.

Even more impressive, according to users and analysts, is the impact Netware 386 will have on user hardware strategies and purchasing decisions.

Netware 386 is expected to give minicomputer-based servers a serious run for the money. As such, it flashes a green light to users who want to dump

Continued on page 6

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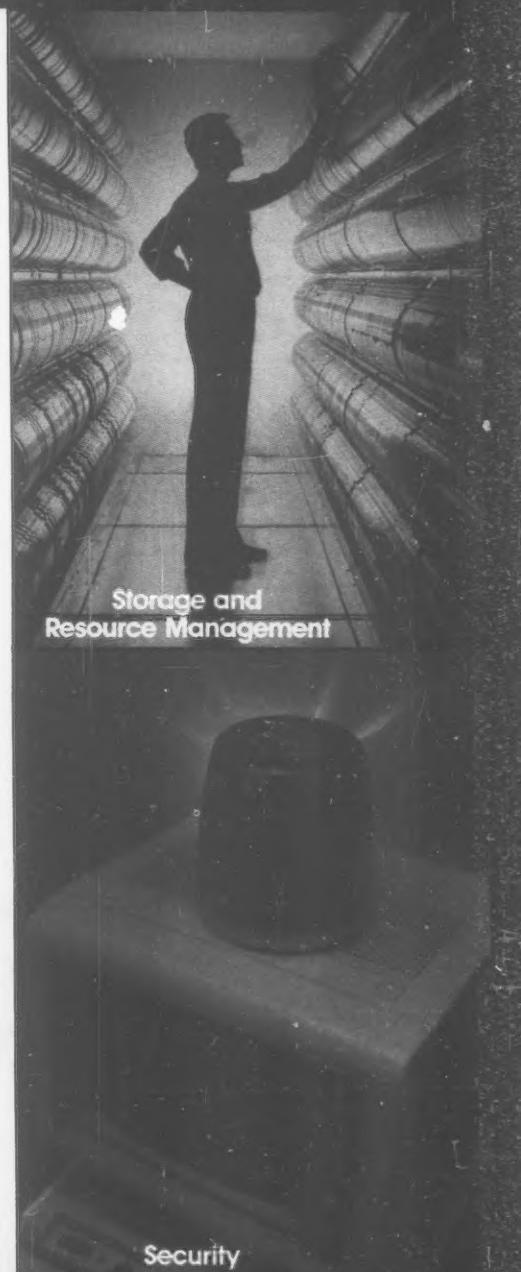
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CDC on spring-cleaning spree

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — For the next six months, Control Data Corp. will refocus its product line, stabilize its customer base and depart from unprofitable market segments such as education, according to Computer Products Group President James E. Ousley.

In Ousley's first interview since he accepted the post a month ago and the company announced plans to cut its work force by 9%, the group's former vice-president of marketing and sales last week outlined a strategy of retrenchment.

The product refocusing will include increased research and development funds for CDC's computer-integrated manufacturing applications, tighter inte-

gration between Cyber mainframes and the workstations supplied by Silicon Graphics, Inc. and its IM/DM relational database product for the Cyber series.

In addition, Ousley revealed that CDC will expand its Cyber line this summer. At the VIM users meeting this week in Orlando, Fla., Ousley said, the company will brief customers on a next-generation processor that will overlap the top end of the popular Cyber 960 and perform with two times the power of the 990.

The company plans to "spend a lot of our energy, both management and dollars, to stabilize the existing base," Ousley said, adding that next year CDC hopes to increase its business by pursuing market segments that it is already familiar with, such as automotive and aerospace.



Ousley outlines CDC's product refocusing strategy

"In hindsight," Ousley commented, "we were trying to do too many things in the applications area and not concentrating enough of our resources where

we felt comfortable."

The market refocusing, Ousley added, will include leaving the higher education market, for which CDC developed administrative software packages. This segment was uneconomical because of the cost of developing customized applications for university customers.

He said the inventory of ETA Systems, which the company folded last month, will be used to "satisfy the requirements of existing customers." He added that the unsold machines are all from the air-cooled P and Q series, not the high-end, liquid-nitrogen-cooled processors.

Ousley disclosed that CDC is actively pursuing relationships with other computer companies to flesh out its computer line. "We have said for some time our strategy was to be able to provide a solution from workstation to file server to front end to top end," he said. "And we still have that strategy and that goal."

OSF: From rebellious to respectable in one year

ANALYSIS

BY AMY CORTESE
CW STAFF

Formed amid skepticism and controversy one year ago, the Open Software Foundation (OSF) celebrates its anniversary this week with a measure of credibility and credit for forcing

the industry to do more than just pay lip service to open systems.

Don Tapscott, managing director of emerging technologies consulting at Toronto-based consulting firm DMR Group, Inc., echoed many former skeptics who suspected key OSF members IBM and Digital Equipment Corp. of ulterior motives.

"Initially, most people saw

OSF as being a ploy on behalf of proprietary vendors to kill Unix momentum," Tapscott said. "But you have to judge people on their actions, and the actions of OSF speak to the fact that these organizations have become serious about this market."

Indeed, the OSF has matured from a group of renegades to a software development firm that has chalked up acknowledged accomplishments. The group has attracted more than 125 members and produced specifications for the widely acclaimed Motif graphical user interface, due out this summer. As time has gone

by, the angry bickering among the rival Unix camps has moderated to a more realistic atmosphere of cooperation.

Even Robert Kavner, president of AT&T's Data Systems Group, who once called the OSF "an untested consortium composed of members with inherently conflicting motives," has expressed his hope that the two Unix camps — the OSF and AT&T's Unix International advisory group — can work together.

In a recent interview, Kavner said there is an informal relationship between the two groups and that the "informal mechanism will get tighter" to ensure that the two Unix operating systems are compatible.

Not fast enough

While many claim that the OSF has accelerated the pace of bringing open systems products to market, users are still frustrated with the wait for open systems. "As a user, I'm impatient," said Jeff O'Neil, director for reservoir computer analysis systems at Arco Oil & Gas Co.

Although the OSF's member companies have committed to OSF/1 for future product plans, the choices available to users today are the same as a year ago. The OSF recently disclosed that while a development version of OSF/1, its first operating system release based on IBM's AIX version of Unix, will be shipped to members in October, the end-user version will not be available until July 1990.

OSF President David Tory said the original schedule, specified last May, was "almost a wish list." He also conceded that there was an unanticipated delay "due to the fight for survival through the summer months, when AT&T brought arms to bear" against the group.

Cosmic swap no problem for Atlantis

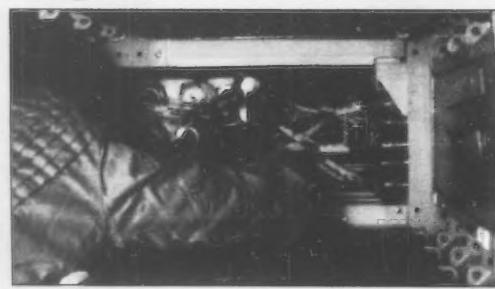
BY ALAN J. RYAN
CW STAFF

HOUSTON — They were not the first people to encounter computer troubles, nor were they the first humans in space. But the most recent space shuttle crew members were the first to conduct an outer-space CPU swap-out.

Astronauts aboard *Atlantis* last week replaced a faulty IBM avionics computer with a spare that had been stored on board.

The computer failure posed no risk to the crew. National Aeronautics and Space Administration (NASA) officials said, because the unit was one of four in a redundant system used to control the shuttle. *Atlantis* landed safely last Monday at Edwards Air Force Base in California.

When the IBM AP-101 system first failed on the fourth day of the mission, the crew was able to get the system working. NASA ground officials, suspecting hardware problems, instructed the shuttle crew to replace the unit to ensure that the



Astronaut Mark Lee works on faulty CPU

failure would not recur.

The swap took 4½ hours and occurred while the shuttle was orbiting the Earth at 17,500 m.p.h., NASA spokesman Charles Redmond said. Much of the time spent on the task involved moving storage lockers that were blocking access to the computers and, as with an earthbound CPU replacement, moving cables.

The actual work involved in replacing the computer was not that strenuous or involved, Red-

mond said, adding that the shuttle flight crews are taught all possible in-flight maintenance procedures during the 18 months they spend as trainees before becoming astronauts. Those classes included instruction on how to change the avionics boxes, he said.

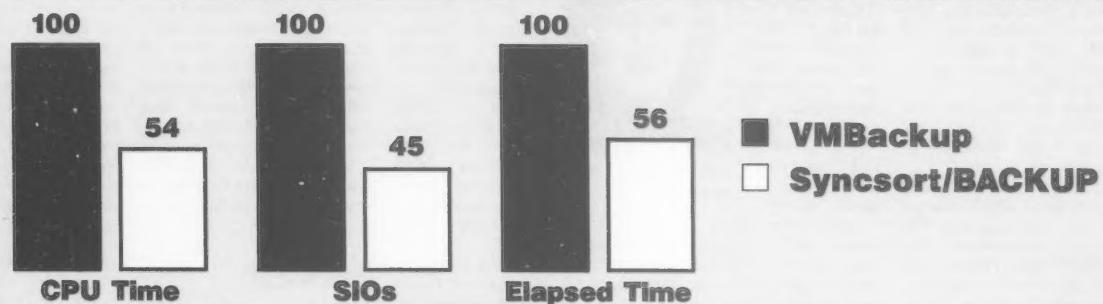
The faulty computer "will go back to IBM's Owego, N.Y., plant, where they will put it through a fault-analysis procedure to find out what part failed," Redmond said.

COMPUTERWORLD

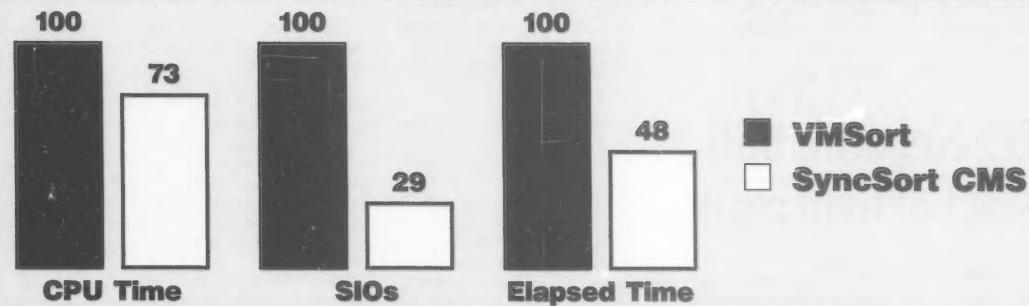
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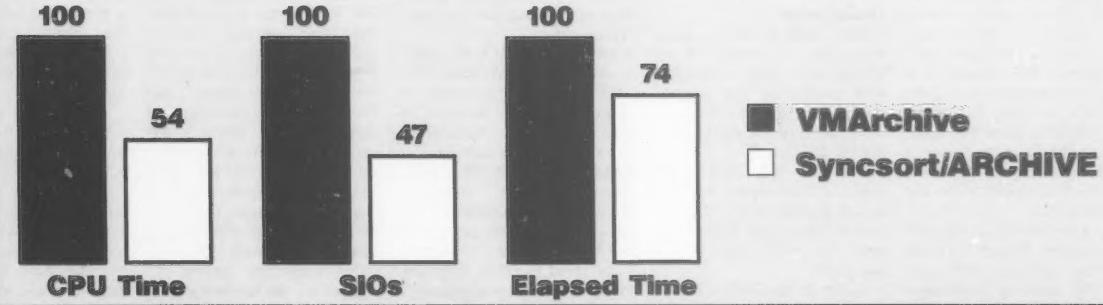
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WHERE PERFORMANCE IS THE ISSUE.

Adapso at age 27: Where to now?

BY NELL MARGOLIS
CW STAFF

SAN DIEGO — The question blazoned across the cover of the program booklet for Adapso's 70th management conference, held here this week, pulls no punches: "Are you going to survive in a rapidly changing marketplace?" Ironically, the same question could be asked of the computer software and service association itself.

Largely because Adapso has not shied away from asking the question of itself, the answer appears to be yes.

At the age of 27, Adapso is confronting the same issues that many of its approximately 900 constituent companies are facing, noted Paula Brooks, who serves as Adapso's membership vice-president and is the founder and president of a growing software company. "We're having to go from being an organization that basically just has to pick up the phone and take orders to one that has to go out and sell itself and its products," Brooks said.

According to newly appointed Adapso Executive Director Luanne James, "Turning Adapso into a marketing organization is our absolute top priority. We're taking a real hard look at everything we do and asking, 'Does it still have meaning? What's missing?'" Among the missing, James said, is sufficient representation of smaller firms. "We've mounted a very aggressive small business initiative," she said.

James' own arrival at the Adapso executive suite complements that initiative. A former small-company founder and chief executive officer, she "can look at small companies through the eyes of someone who's taken a walk in those shoes," a former Adapso executive said.

If, and as, Adapso turns into a more successful marketing organization, noted Brooks, it might

find some of the other gaps in its representation automatically filled in. "Entrepreneurs are typically concerned with basic issues such as how to meet the payroll," Brooks said. "When you get to Adapso and hear debates on questions like international copyright protection, the natural immediate reaction is 'What does all this have to do with me?'" The marketing effort will attempt to convince such companies that they are affected by those issues.

"Adapso's responsiveness has not been as fast as it should have," said board member Robert Laurence, president of Oracle Complex Systems Corp. "But changes in the industry have come about so fast that it would be hard for any umbrella organization to turn around quickly." The formation of Adapso's Sys-



Luanne James looks for missing pieces

tems Integration group, which Laurence heads, is evidence of the organization's ability to adapt, he claimed.

The organization has adapted to its former archrivals, the Big Eight accounting firms. Once an adversary of major accounting firms' forays into information systems consulting, Adapso now welcomes them as members.

This spring, then-Executive Director George DeBakey's abrupt resignation sparked rumors about internecine battles at Adapso, perhaps along old-vs.-new lines. But officials, members and observers agreed that Adapso is just going through inevitable growing pains.

Charles Varga, a former Adapso official and longtime industry observer, recalled that in

its early days, Adapso's mission was to rally software and services firms into perceiving themselves as an industry. Therefore, early Adapso leaders were adept "at reading the pulse of the members and coming up with messages that would band them together: Fight IBM! Fight the Banks! Fight for Copyrights!"

The recruitment of DeBakey from federal government service was meant to address the issue of giving Adapso more clout in Washington. The mission succeeded, numerous Adapso executives said. DeBakey's departure, they agreed, was triggered by his desire to focus on foreign policy issues at a time when increasing industry diversity requires that Adapso expand, not narrow, its perspective.

386 servers at \$1,500 each and a 300M-byte drive costing \$1,200, coming up with a total of \$9,200. Netware 386 software alone costs \$7,995, although it supports 250 users and offers up to 32 terabytes of disk storage.

Minicomputer vendors are caught in a squeeze play, according to Mary Modahl, an analyst at Forrester Research, Inc. in Cambridge, Mass. LANs, particularly Netware 386, are moving up to threaten minis. Even so, these same vendors have no choice but to write to Portable Network, Novell's portable Netware code based on Netware 386, because users will demand it.

•

"Novell has made a quantum leap in terms of the number of users supported, which we perceive to be in high demand," Modahl said.

While Novell estimated that 250 users in the Digital Equipment Corp. environment will require a VAX 8900, 286 Netware is better contrasted with DEC's new VAX 6300 family, said Frank Dzubek, president of Communications Network Architects, Inc. in Washington, D.C. The Novell solution will be less expensive, but that is not the real issue, Dzubek explained. "It's the power of 250 PCs and access to all those 10M-byte drives vs. one mini," he said.

Even so, among Netware users, it is only when the price issue comes up that some mouths go dry.

"Cost is the only concern here," said Richard Thomas, manager of end-user support at Welch Allyn Corp., a Skaneateles, N.Y.-based manufacturer of medical diagnostic equipment. He uses two Advanced Netware 2.12 servers to bridge his 75-node Token-Ring LAN. Thomas said it is a toss-up whether users are better off paying for an Intel Corp. 80386 version or doubling the size of their 80286-based Netware LANs.

He tallied the cost of two copies of 286 Netware — each supporting 100 users and street-priced at \$2,500 each — two

loads of people were fascinated by the features and benefits, but there was a kind of unhappy feeling in the crowd when the \$7,995 price tag was raised," said Robert Brown, the group's program director.

"If it wasn't that expensive, I'd recommend it for all my servers," said Paul Zonfrillo, a LAN support administrator at Keystone Provident Life in Boston. He said he hopes to win his boss over to Netware 386 by pointing out that price is relative given that Keystone has decided to dump its mainframe for a LAN-based system.

Others may find that argument relatively easy to win. "For large corporations that are [big iron]-oriented anyhow and spend up to \$20,000 on applications, [Netware 386] is a drop in the bucket," maintained Keith Brown, a vice-president at Brown & Associates, a Waltham, Mass.-based network reseller.

"Eight thousand dollars doesn't faze me; I look beyond that," agreed Ralph Sampson, director of telecommunications at McKesson Corp. in San Francisco. His firm expects to decide by this summer whether to standardize on IBM or Novell LAN technology.

Novell's Netware 386 moves out of mini realm

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Novell, Inc. directly targeted the MIS manager last week with the announcement of Netware 386, server software said to provide minicomputer performance from a microcomputer platform.

"Netware 386 amounts to a virtual minicomputer," said Darrell Miller, executive vice-president of Novell's Software Group. "We can distribute the power of a mini onto multiple systems and continue to add hardware as the network grows."

Netware 386 will be released in two stages. Version 3.0 ships in the third quarter and can support 250 personal computers from a single Intel Corp. 80386-based server with 16M bytes of main storage and a 300M-byte

hard disk.

The new 32-bit operating system is upwardly compatible with previous Netware releases by plugging in the Netware 386 file server, Miller said.

Lower price

Industry analysts said the major advantages of Netware 386 are its low price when contrasted with comparable mini servers, its high performance and its ability to address the forthcoming Intel 80486 chip.

Netware 386 Version 3.0 supports file-and-print services as well as DOS, OS/2, OS/2 Extended Edition and Apple Computer, Inc.'s Macintosh operating system.

Netware 386 Version 3.1 — due out next year — will incorporate support for Unix, Transmission Control Protocol/

Internet Protocol, X.25 and Sun Microsystems, Inc.'s Network File System file-transfer protocol.

Novell announced a suite of enhancements and developers' tools, including the following:

- Netware Programmers Workbench, a developers' environment for building distributed applications.
- Improved security. Enhancements include password and software key encryption on the wire and file- and directory-level trustee rights.
- Add-in boards. A 32-bit adapter for IBM's Micro Channel Architecture and enhanced disk co-processor boards, designed to minimize system bottlenecks caused by intensive disk I/O.
- Easier installation. While users complained that Advanced Netware is a nightmare to install, Netware 386 reportedly can be installed in 15 minutes. "Compared to other operating systems, it does install quickly," said Nina Burns, a vice-president at Infonetix, Inc. in Santa Clara, Calif.

Future releases will address such traditional MIS concerns as mirrored data capabilities, database services, recovery facilities, LU6.2, IBM's Systems Network Architecture Distribution Services and X.400.

Netware 386 reflects attention by Novell to the systems capacity planning needs of customers, Burns said. "In the past, several platforms have come up from a grass-roots level, taking PCs and adapting them to be a file server," she said. "But Novell's Netware software is ahead of the capacity of the hardware."

Advanced Netware 2.15 (286)
16-bit operating system
100-user limit
1,000 open files
12M bytes of RAM
265K-byte maximum volume
2G-byte maximum storage
None
Optimized for 286, runs on 386
32,000 files per volume
Up to 1 million files per server

Netware 386 Version 3.0
32-bit operating system
250-user limit
100,000 open files
Up to 4G bytes of RAM
32-terabyte maximum volume
Same as above
Multiple file name directory
Optimized for 386, runs on 486
2 million files per volume
Up to 66 million files per server

* On 286 Netware, a volume or file cannot span more than one drive vs. up to 32 drives on Netware 386. There are security, printer management and installation differences between the two products as well. Novell claims to have more than 400,000 Netware servers installed supporting more than 4 million users.

SOURCE: NOVELL, INC.

Apple lays out plans to outrun OS/2 with Mac technology

BY PATRICK WAURZYNIAK
CW STAFF

SAN JOSE, Calif. — In a preemptive strike aimed squarely at the OS/2 operating system, Apple Computer, Inc. outlined the next-generation system software for its Macintosh personal computers last week.

Apple disclosed the architectural details of System 7.0, an operating system update that will reportedly provide Macintosh computers with true multitasking, 32-bit addressing and virtual-memory capabilities.

Although Apple would not specify when it will deliver the update to end users, the company plans to furnish the updated system software in developer kits to its third-party developers later this year. End users presumably will not get updates until sometime next year.

The System 7.0 update, which is said to work with all Macintoshes from the Macintosh Plus through the Macintosh II line, will require a minimum of 2M bytes of memory, meaning most will need an additional 1M byte beyond the typical standard memory configuration.

Jean-Louis Gassee, president of Apple Products, said that with System 7.0, Apple has "made something that is more powerful and simpler, which is something that is not always seen in the computer industry."

Apple-DEC pact finally yields some results

SAN JOSE, Calif. — More than a year after the alliance was forged, the joint development agreement between Apple Computer, Inc. and Digital Equipment Corp. has borne fruit.

Until now, the pact has only resulted in guidelines for third-party developers, and no products have been introduced by either firm. Apple officials have said that developer guidelines will ensure that third-party products are based on standards and will be compatible.

At a conference for independent developers held last week, Apple said the development effort will include DEC's Local Area Transport (LAT) terminal services technology. LAT has been the mode by which DEC terminals have been connected to multiple VAX minicomputers.

LAT will be incorporated into Apple's Communications Toolbox, a new feature in the Macintosh operating system that extends the Mac Toolbox into the communications environment.

A Mac can now offer DEC VT series terminal emulation when hooked into an Ethernet network and can have terminal access to DEC hosts without additional networking software. The new application programming interfaces and development tools are currently available to certified developers.

JULIE PITTA

System 7.0, company officials said, will add multitasking and the ability to address up to 4G bytes of memory through 32-bit addressing. Additionally, a virtual-memory capability will enable a user with a Motorola, Inc. 68030-based Macintosh II to extend available memory by transparently treating the hard disk as additional memory through the 68030 chip's standard memory management unit.

"There's no question it's the biggest system software upgrade Apple has ever

done," said Nick Arnett, an analyst at Creative Strategies Research International, Inc., a Santa Clara, Calif.-based market research firm.

"The things that Apple announced here don't by themselves propel Apple past OS/2, but the combination [of System 7.0] with the Macintosh's existing capabilities and installed base of applications does," said Arnett, referring to Apple's push to retain a technological edge over its rivals in the IBM Personal Computer world.

Apple's System 7.0 also includes a new Inter Application Communication Architecture to create an integrated application-to-application communications network that allows applications to exchange data and instructions on a single Macintosh or over a network.

tosh or over a network.

One corporate user of the Macintosh said the firm's strategy lends credence to perceptions that the machine is technologically ahead of OS/2, which to date has seen lagging user acceptance mainly because of a lack of applications.

"What IBM is promising is what Apple is delivering," said Mike Bailey, systems integrator at the Sunnyvale, Calif.-based Lockheed Missiles and Space Co., which has more than 2,000 Macintosh systems installed in addition to many IBM computers.

"If you feel OS/2 is fact, you'll say that IBM is ahead of Apple, but if you feel like I do, Apple is ahead of IBM," said Bailey, who noted that many DOS users are still using MS-DOS Version 2.2.

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Location - Spring '89

Washington, DC / May 9	Houston, TX / June 14
New York City, NY / May 16	Denver, CO / June 26
Boston, MA / May 17	Seattle, WA / June 29
Chicago, IL / May 24	San Francisco, CA / June 28
Minneapolis, MN / May 23	Los Angeles, CA / June 27
Dallas, TX / June 13	

Location - Fall '89

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NEWS SHORTS

Alleged VAX smuggler surfaces

The five-year search for accused smuggler Richard Mueller came to an end last week when the export businessman surrendered to authorities in his native West Germany. The flamboyant Mueller had been sought by U.S. Customs officials since 1983 for his alleged role in trying to ship Digital Equipment Corp. VAX computers illegally through South Africa to Soviet bloc countries.

Cullinet sees black

Cullinet Software, Inc. is about to cut its losses — 11 quarters' worth. The company said last week it expects to report a profit for its fiscal fourth quarter ended April 30. Moreover, said Executive Vice-President of Marketing Jeffrey Papows, the outlook for sustained profitability is bright. The figure, he said, rests on a foundation of solid revenue increases "across all product lines and all continents."

Runtine Ingres for Ultrix

DEC will announce this week that it will bundle a runtime version of Relational Technology, Inc.'s Ingres database management system with its Ultrix operating system, according to sources. Jim Barclay at DEC's corporate software engineering group acknowledged that a DEC announcement will include a runtime version of a third-party DBMS with Ultrix, although he declined to confirm that Ingres is involved.

Wingz flying to Apollo

Apollo Computer, Inc. announced last week that it will make a broad range of Informix Software, Inc. DBMS products available on its Unix-based workstations. Included among the offerings will be Wingz, a graphics spreadsheet previously available only on Apple Macintosh systems.

Just the fax

Ricoh Corp. recently highlighted some of the expanded facsimile capabilities that will be available once Integrated Services Digital Network (ISDN) becomes widespread in the 1990s. Ricoh showed a prototype fax adapter based on CCITT Version '88 Group 4, Class 3 mixed-mode standard. This combines image files with character-coded data, minimizing the line capacity required to send a message. ISDN users can fax documents while speaking to the recipient.

TI joins Acer in chip plant deal

It's a deal in which Texas Instruments, Inc. supplies the technology and Acer, Inc. puts up most of the money. The joint-venture company they create will build a \$250 million dynamic random-access memory factory in Taiwan. TI, now manufacturing in the U.S., Europe and Japan, boosts itself into the hot Asian Pacific area and gets exclusive rights to the plant's output. Acer will get majority ownership of the company.

Open systems in the East

The open systems activity will be happening in Japan this week. An X/Open board meeting in Tokyo will vote on issues including granting the Open Software Foundation full member status and a graphical user interface specification that promises to be OSF/Motif-like. Unix International members will also congregate, having recently appointed a director for its new Asian Pacific office. Additionally, Japan's Sigma project, a joint government and corporate effort, is sponsoring a symposium in which much of the discussion will center on Unix standards.

NCR ties Unix and Token-Ring

NCR Corp. has introduced NCR TR/IX, software said to allow users running Interactive Systems Corp. 386/IX-based Unix personal computers as servers to add Token-Ring-linked DOS workstations to their networks. Data exchange, file conversion and electronic mail capabilities are supported.

ASM parley stresses business skills

BY CLINTON WILDER
CW STAFF

DALLAS — Marketing. Strategic planning. Financial controls. Public relations.

What sounds like a standard business school curriculum should be the action plan for information systems executives to manage and promote their own departments, Association for Systems Management (ASM) members were told last week at ASM's 42nd Information Systems Conference here. The common theme of several well-attended sessions on executive issues was that IS directors must do a better job of managing traditional business functions.

"If it was you profit going into your own pocket, would you manage [your IS department] differently? I bet you would," said Gary Kirkham, founder of Forecasting Planning Associates, a consulting firm based here. Kirkham, a former IS employee at FMC Corp. and Atlantic Richfield Co., added, "I didn't learn about selling until I left MIS."

The selling of IS — its suc-

cesses for the company and its strategic potential — is critical to forming the necessary partnerships with line management, several speakers said. "It's the responsibility of IS to inspire a set of line [management] believers," said John F. Rockart, director of the Center for Information Systems Research at MIT's Sloan School of Management.

"Partnership is an overworked word, but it's a doggone good word."

Rockart emphasized that line, or functional, managers must take the lead in targeting strategic areas for the use of IS, with the IS director encouraging

and supporting that effort with both education and the technological infrastructure. Because of the partnership, this new breed IS executive should have more importance and power in his new support role than his predecessor did in the lead role of the back-office data processing shop.

"The line really needs a very strong partner," Rockart commented. "DuWayne Peterson at Merrill Lynch is highly paid and sits on the five-member executive council because he has the



Sloan's Rockart looks to inspire believers

line involved."

Speakers urged ASM members to do a better job of flag-waving within their organizations in publicizing the benefits of IS.

"If we're going to break away from the administrative vision of IS, we must report the value added," said Matthew Boyle of N. Dean Meyer & Associates in Ridgefield, Conn.

John Framel of IR Concepts in The Woodlands, Texas, said IS directors should not be discouraged by lack of support for the strategic use of IS from the very top of their organization. "If you can't get the CEO or chairman, look for that one individual in your organization who may take the concept and start to make it reality," he said.

There were approximately 550 members of the Cleveland-based ASM attending the biannual conference.

CA users

FROM PAGE 1

cal College in Madison, Wis., said he was relieved at the suspension. Huber said that he expects about a 5% maintenance cost increase for the year. "I'm much happier now," Huber said. "I would have had a 40% increase."

John Showers, manager of technical support at Diamond Shamrock in San Antonio, said that under tiered pricing he would have had increases of about 55%. "CA is going to stagger the increases a bit," Showers said. "That makes me feel a little better, but they're only backing off the tiered price increase for a year."

According to Sanjay Kumar, CA's vice-president of strategic planning, customers were not concerned about tiered pricing, to be instituted next year, but about the increase's impact on their budgets.

Kumar said that CA had not been aware that ADR increased prices twice and increased maintenance fees last year, which together with tiered pricing, created "inordinate" maintenance price increases," he said.

CA has suspended tiered pricing for maintenance on products licensed from ADR before Oct. 13, the date of the ADR acquisition.

The suspension applies to all invoices for maintenance periods that have starting dates before Dec. 31, 1989. All maintenance invoices licensed by ADR that have a starting date between June 1 and Dec. 31 will not include the tiered pricing increase.

Invoices with a starting date between Oct. 13 and May 31 that carry the tiered pricing increases will be eligible for a credit on account or a cash refund.

SCO rolls out Open Desktop kit for application developers

BY PATRICK WAURZYNIAK
CW STAFF

SANTA CRUZ, Calif. — The Santa Cruz Operation, Inc. (SCO) last week began shipping a developer kit for Open Desktop, an integrated multiuser, multitasking operating environment for Unix-based workstations that was announced in February at Uniforum 1989 (The International Conference of Unix Users).

SCO's initial release of the Open Desktop development system is being shipped to application developers that have joined its Open Desktop Developers Program.

SCO said the Open Desktop developer kit will enable application software developers to ship applications by this fall, when Open Desktop will be generally released.

Open Desktop was designed to give business and technical users of Intel Corp. 80386-based computers the features and benefits of high-end graphical workstations at personal com-

puter prices, SCO said.

Among early Open Desktop developers, Applix, Inc., in Westboro, Mass., said last week its Alis integrated office automation software will meet Open Desktop specifications, enabling the software product to run on any 80386-based computer using Open Desktop. Applix's Alis software enables computer users to create compound documents combining text, graphics, spreadsheets and database elements. Alis is slated to be available by September in an Open Desktop version.

Open Desktop combines enhanced Unix System V and DOS functionality in a package that includes an integrated graphical interface, an open SQL-based database and networking capabilities for connectivity to various hardware platforms.

SCO said the Open Desktop developer program is available until Sept. 1 for \$5,000, although it is offered for \$3,000 to participants in the SCO developers program who pay a \$295 annual membership fee.

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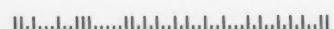
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COMPUTERWORLD

New IS chiefs at financial firms

BY ROBERT MORAN
CW STAFF

NEW YORK — Francis Dramis, former president and chief operating officer of Telic Corp., has been named to the posts of managing director and chief information officer at Salomon Brothers,

Inc.'s Business Technology Organization.

Dramis, 41, takes over the position today and will be responsible for the development of the new division, which is charged with bringing advanced systems and technology to the company.

He will report to Bruce Carp, the firm's chief administrative officer.

Dramis has held positions at Bell Laboratories, Transtech and AT&T, where he was the executive director in charge of information product management and automation in the

AT&T Business Markets Division.

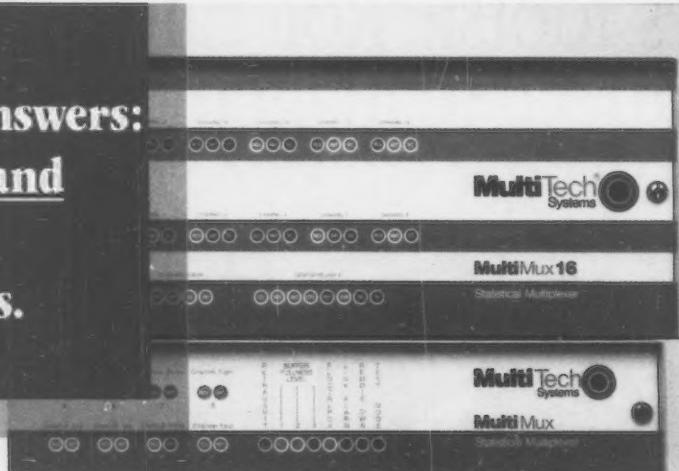
In another shuffle in the MIS ranks of the financial industry, Bruce Hasenberger has been appointed senior vice-president and director of corporate systems in Chemical Bank's Information & Technology Management Group.

Hasenberger brings more than 25 years of data processing ex-

perience to his new post. His most recent position was first vice-president and director of corporate MIS at Merrill Lynch & Co.

Hasenberger replaces Frank Carnella, former executive vice-president and director of development services. According to a company spokesman, Carnella left the company to pursue other interests.

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Bailing out

FROM PAGE 1

Sources said that Capozzoli and other federal executives are leaving mainly because of the low pay, but the ethics law was the final straw.

A federal commission proposed a 50% pay raise for top federal executives last December, but on Feb. 7, Congress vetoed a bill tying that hike to a controversial increase in congressional salaries.

"A lot of people are discouraged as a result of that [pay defeat], so I think there will be more [computer executives] leaving in the next several months," said Reed Phillips, director of information resources management at the U.S. Department of Commerce.

"Had the pay raise been adopted, the vast majority of executives would not be terribly concerned about their employability outside the federal sector," added Carol A. Bonosaro, president of the Senior Executives Association, which represents the interests of federal career executives.

Bonosaro said the pay gap between the federal and private sectors is roughly 40% for senior executives. *Computerworld's* 1988 salary survey, however, showed a smaller pay gap; it found that top IS executives in the government sector make an average of \$75,187, about 7% less than the private sector's average salary of \$80,050.

Not the only ones

In addition to Capozzoli and Szervo, senior executives at the National Aeronautics and Space Administration, the Federal Aviation Administration and the Department of Defense have resigned because of the ethics law.

The law in question is the Office of Federal Procurement Policy Act Amendments of 1988, which seeks to slow down Washington's notorious revolving door. It prevents a federal official who leaves government from working for contractors that won procurements handled by that official.

The restriction ends two years after the official ceases to be "personally and substantially" involved in the procurement. Violators face penalties of up to five years in prison and fines of up to \$100,000.

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CASE buyers await repository

B. STANLEY GIBSON
CW STAFF

WASHINGTON, D.C. — MIS managers concede that computer-aided software engineering (CASE) lags behind its potential because they are as yet unable to

put it to use. But attendees at last week's CASE Expo show here said IBM's much-anticipated repository may be the catalyst in overcoming long-standing inhibitions toward CASE.

Among the factors managers listed as hindering CASE use are

the following:

- The inability of MIS shops to change their cultural approach to software development.
- Upper management's resistance to CASE or inflated expectations of it.
- The smallness of some CASE

vendors and the limited nature of some of their tools.

- A standard repository, data dictionary or encyclopedia.

If IBM's repository, which the company has said will be announced this year, performs as promised, it should provide a platform on which a variety of tools can interface. In the process, it should lend credibility to the host of smaller CASE ven-

dors whose tools will attach to it.

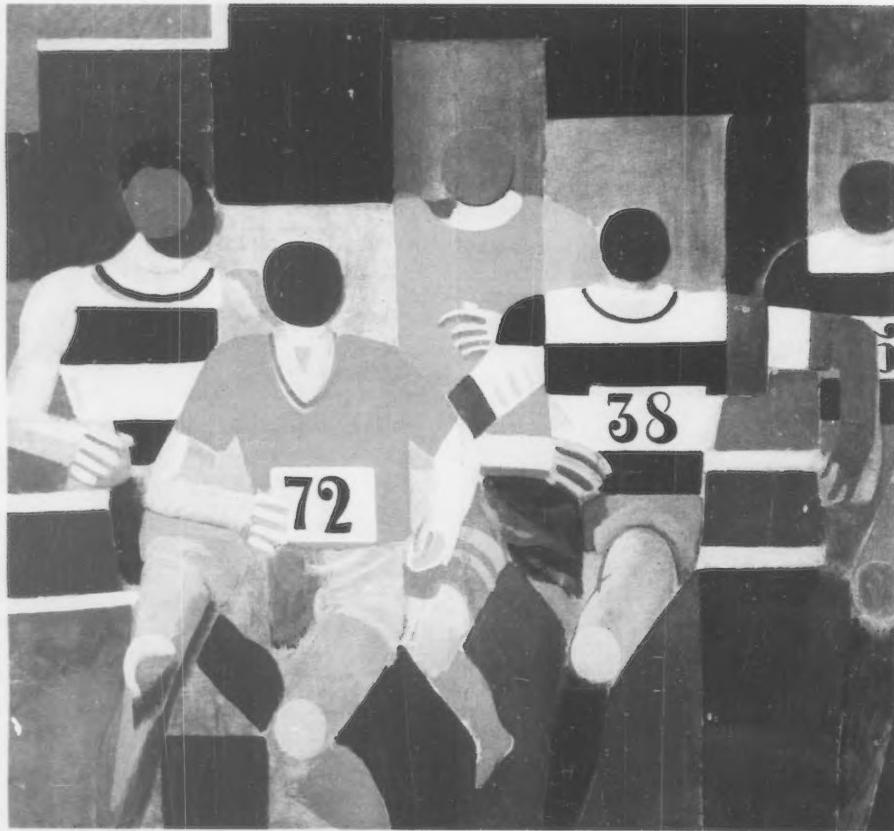
In addition, simply the perceived blessing of IBM could help turn the tide of management resistance to CASE, several attendees suggested.

"You need to be able to have multiple users on one encyclopedia, and you would need a repository to do that," said Kamal Dewan, database administrator at Telenet Communications Corp. in Reston, Va.

"Linking developers is a good goal, but getting them to talk to each other is hard enough, especially when they have PCs," said the director of software engineering at a systems integrator in the Washington, D.C., area who asked not to be named. He said flashy personal computers often cause users to become even more absorbed in their work and less communicative.

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YOU NEED TO be able to have multiple users on one encyclopedia, and you would need a repository to do that."

KAMAL DEWAN
TELENET

design specifications, all their work may not integrate," the director added. He said his major interest at the show was to find a Unix-based CASE environment with a repository.

Steve Sangaro, manager of end-user computing at Telenet, said he has high hopes for IBM's repository, although he is not certain those hopes will be realized: "Will you be able to get the data from tool to tool? The repository could solve the problem. If not, it's years of hype."

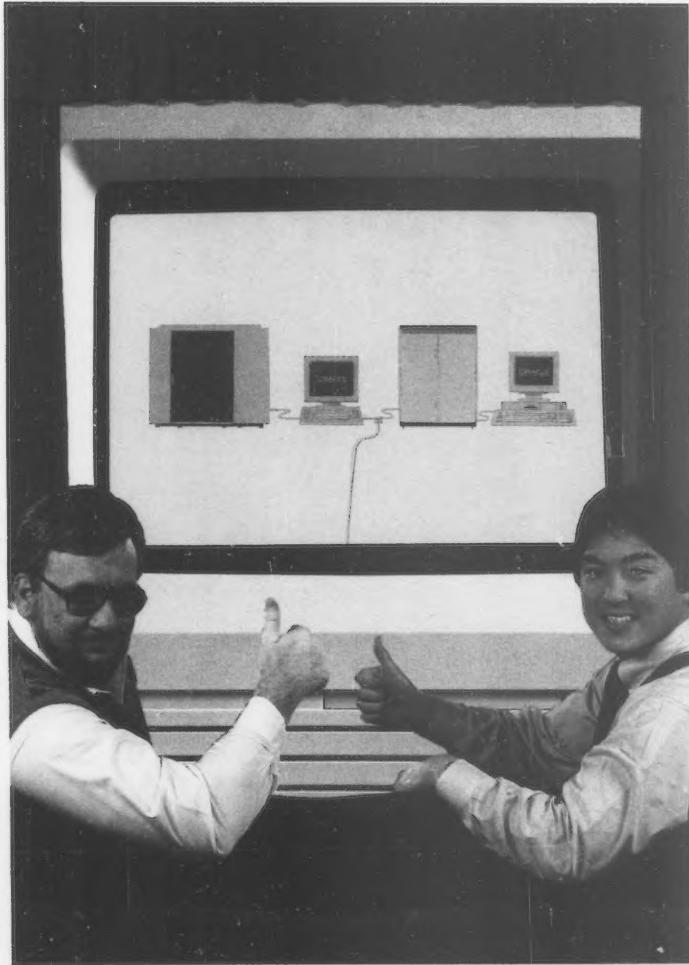
Telenet recently performed an MIS audit and determined that it needed to implement CASE. Now the company is in the process of deciding on the tools. "If you're not doing this within five years, you're dead," said John Dixon, manager of technology planning and support at Telenet.

Although the IBM repository may foster the proliferation of numerous CASE tools, those tools will be sold by fewer companies. There is a clear trend among CASE vendors toward consolidation.

Sage Software, Inc. in Rockville, Md., announced at the conference that it plans to acquire Visual Software, Inc., a start-up in Santa Clara, Calif., with \$1 million in sales. Several weeks earlier, Sage acquired Polytron Corp., a vendor of PC-based configuration management and version-control technology.

Several other CASE vendors have also announced acquisitions in recent months.

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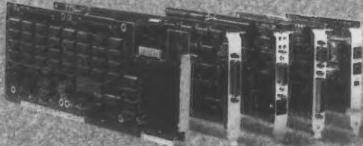
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Built-in interfaces mean you can connect a mouse, printer, modem or other tools without taking up a slot.

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COMPAQ

It simply works better.

Codex customizes Netview link

BY ELISABETH HORWITT
CW STAFF

CANTON, Mass. — Codex Corp. introduced last week what may be the first direct link between a non-IBM leased-line modem and IBM's Netview.

Codex's Dualview Management Option uses IBM's own Link Problem Determination Aid 2 (LPDA2) protocols to allow Netview operators to monitor, reconfigure and collect alerts and alarms from the Codex 2600 series of high-speed

leased-line modems, the vendor said.

However, the Codex product bypasses Netview/PC, IBM's recommended Netview route for third parties, thereby tackling the computer giant on its home ground in the heated high end of

the modem market, one analyst said.

By providing its own modems with the same Netview capabilities that IBM modems enjoy, Codex hopes to eliminate IBM's ability to "gain account control via Netview," said Codex senior product planner Robert Ries.

Customers for whom Netview-based control is a prerequisite can now shop beyond IBM

and gain additional functions such as Dualview's 19.2K bit/sec. transmission rate, which IBM does not yet support, Ries said.

Codex, which has about 10% of the modem market to IBM's 5%, is going head-to-head with IBM in one of the market's more dynamic segments — high-speed leased-line modems that can be hooked up to a centralized network management system, according to Josh Gonze, a research analyst at International Data Corp. in Framingham, Mass.

Power problems

While a number of modem makers support IBM's Netview/PC interface, users have reported "a lot of problems — that Netview/PC is not powerful enough, that the [Netview] capabilities it supports are weak, that it is not comparable to the modem vendor's own network management system," Gonze said.

Dualview represents "a genuine move toward an integrated multivendor network," Gonze added, because "normal Netview" is used to manage another vendor's equipment. In contrast, most integration comes down to putting different vendors' systems on different screens and "toggling back and forth," Gonze said.

Codex has added some capabilities to the Netview applications such as changing a Codex time-division multiplexer's allocations of bandwidth to different modem ports and adding terminals or controllers, Ries said.

Managerial power

However, Codex still provides more management functions for its modems through its two existing network management systems, Ries said. Those systems already support Netview through the Netview/PC interface, he added.

Dualview is implemented as firmware on Codex modems, eliminating the cost and potential reliability problems of a separate box, Ries said.

This feature differentiates Dualview from Netview/PC-based solutions, which require an IBM Personal Computer or Personal System/2 in the middle, and also from a modem controller from Netquest, Inc., which is said to provide a direct Netview link for a variety of vendors' modems. The controller is priced at \$1,000 per line, Netquest said.

Netquest also announced a CCITT V.32 modem last March that is said to incorporate a direct Netview link.

Customers can have their 2600 modems field-upgraded with Dualview for \$350 per modem, Codex said. A factory installation is priced at \$195 per device. General availability for the option is scheduled for August.

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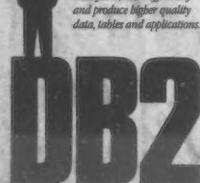
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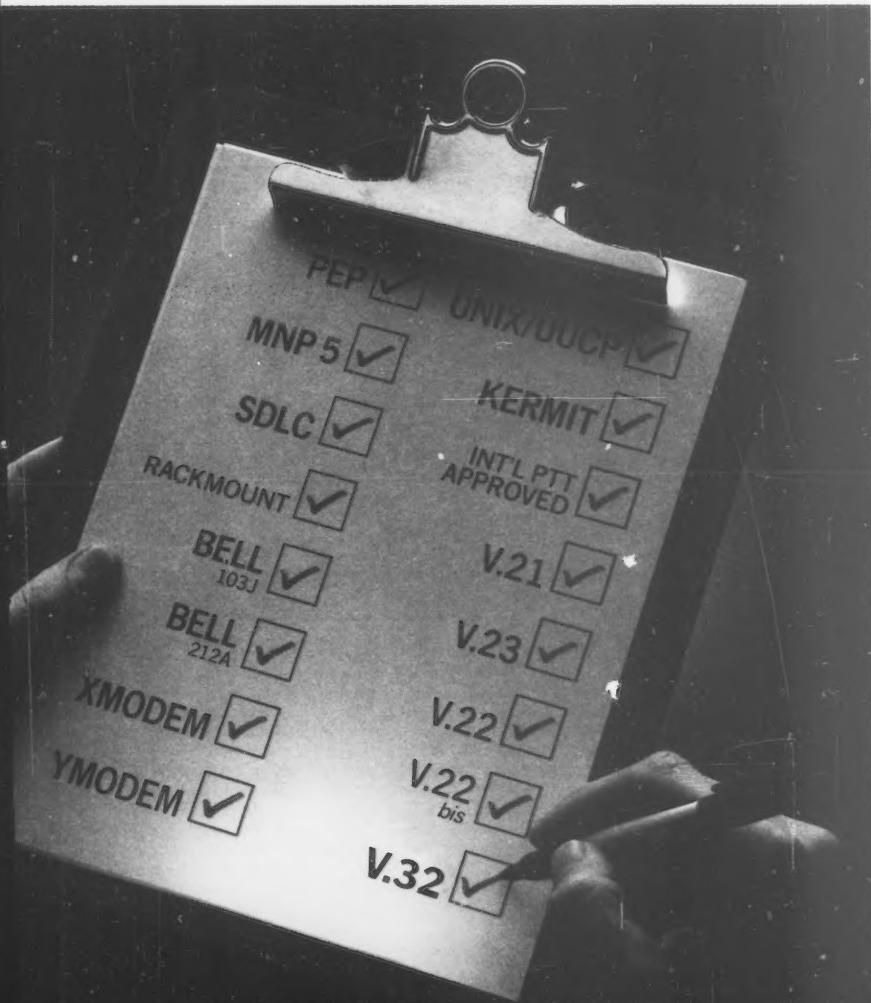
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Small fish can make big waves

PCs outrun two supercomputers in government acid rain study

Editor's note: This is one in a series of profiles of nominees for the Computerworld Smithsonian Awards, recognizing individuals and organizations that have achieved outstanding progress for society through the use of information technology. The awards will be presented in a ceremony held June 20 in New York.

BY KELLY SHEA
CW STAFF

WASHINGTON, D.C. — In fighting the battle against acid rain, the basic strategy is finding out who is doing what to whom. And the Environmental Protection Agency is using a personal computer to figure it all out.

Brand Niemann, special assistant and program analyst on the acid rain staff in the EPA's Office of Air and Radiation, is the technical point man in a program that provides information on acid rain and other air pollution to anyone who needs it — from elementary school students to EPA administrators to members of Congress to the president. Niemann is in charge of running the IBM Personal Computer AT as well as other micros and PC software that have been generating acid rain models and forecasts for the past six years.

The setup's germination was in legislation introduced by Sen. Daniel P. Moynihan (D-N.Y.) in 1980. The bill founded the National Acid Precipitation Assessment Program (NAPAP), a 10-year interagency research program funded at about \$500 million. Niemann, who had already begun working for the EPA on the acid rain problem in the late 1970s, was also initially involved in the application of the



EPA's Niemann with a computer screen that demonstrates the use of the program he developed

SUSAN STEINKAMP

NAPAP results. NAPAP started working on mainframes to develop solutions to the problem and today devotes two Cray X-MP supercomputers to the task. But Niemann always thought it could be done differently.

"I told my original supervisor at EPA, Charles Elkins, 'I think this can be done on a personal computer.' And he said, 'Well, let's do it.' And we sat down together and did a very, very simple version using 1-2-3, and then we just kept making it more and more sophisticated," he said.

PC prowess

Elkins has since moved on within EPA, but Niemann has brought the PC project — initially considered only as an interim solution, then a backup solution, to the supercomputer project — forward to its current status as the EPA's primary, proven acid rain information program.

While not the only one of its kind, the EPA "was one of the first to develop the approach, which is a simple and clear one," said Paolo Zannetti, editor of *Environmental Software*, a Mon-

rovia, Calif.-based journal.

In addition to the PC hardware and Lotus Development Corp.'s 1-2-3 Version 2.01, the setup employs Lotus GraphWriter I and Aldus Corp.'s Freelance Plus 3.0. There are also various printers and plotters that are used to churn out the many charts, maps and graphs that Niemann produces. He said he is extremely eager for 1-2-3 Release 3.0. "What's really limiting me now is having to break things up into multiple worksheets," Niemann said. Release 3.0's "dynamic linking is just the way to go for me."

Niemann uses 1-2-3 in combination with informational databases downloaded from EPA's IBM 3090 in Research Triangle Park, N.C., to do mathematical analyses on what is called the source-receptor problem. The problem is simply explained by a sample question: "What do the emissions from a state like Ohio do to the sensitive areas in the Adirondacks in New York?" He is also able to answer more basic questions such as "How many lakes will be ruined?" and

and the assessment is always made on current strengths and ability."

Banyan is in the process — "with or without Dick" — of ramping up for a major marketing push during the second half of the year, according to Mahoney.

"We'll be more aggressive and noticeable, we'll have a new promotional campaign, and we'll be hiring some key people to add to the management, marketing and product development teams," he said.

Previously employed at Convergent Technologies, Inc., Meise joined Banyan in April 1987. Since that time, the organization has grown from 130 em-

"Which streams have been acidified?"

But can a PC-based program possibly compete with two supercomputers? "Amazingly,"

Niemann said, "I found being limited to using a PC forced me to think more creatively and problem-solve more effectively than if I had had a supercomputer." He added that there has not been a scientific analysis that he has been asked to perform that he could not do within the 1-2-3 worksheet environment.

While successful, not all aspects of the PC project have proceeded smoothly. Because of the rather bureaucratic nature of the government, Niemann said, it was difficult to get some NA-

PAP officials even to consider the need for a backup program.

"They were so convinced that [supercomputers] were the way to go that they stopped doing everything else. In fact, they would not even tolerate any competition," he said. Soon, however, the two projects' results will be merged for comparison. But the final results of the NAPAP program will not be presented until September 1990.

Today, both the PC and supercomputer programs are being used to assist the Bush administration's plans for increased environmental controls. Late this month or in early June, the acid rain portion — as well as the air toxics and ozone portions — of the Clean Air Act Reauthorization will be introduced by President Bush. "We are providing initial analysis and scenarios" of the atmospheric effects of acid rain, Niemann said. "Then, the policy analysts all the way up to the White House consider the political ramifications of every possible variation."

The most critical question concerns determining the magnitude and timing of the emissions reductions. Niemann explained the two-pronged issue in this way: "What is enough of a reduction that it will mitigate the damages that we see? And on the other hand, what is the minimum reduction required to minimize the cost and to be politically acceptable to as many of the affected parties as possible?"

Answering these questions is a political process full of compromise, Niemann said, and the PC system helps provide the facts for well-informed debate.

The impact of EPA's program is indeed wide-ranging. But for Niemann, a personal aspect of the project has been proving that, with the right technology, a small fish can do a lot in a big pond.

What is acid rain?

Acid rain" is not only rain, sleet and snow, but also fog, clouds, pollen and even dust. The acid comes from air pollution — such as sulfur dioxide emissions from coal-fired industrial smokestacks — which rises into the air, reacts chemically with just a little bit of moisture and produces acid — such as sulfuric acid.

Usually, weather patterns blow the acidified vapor to other locations, where it gets washed back down to Earth with precipitation. Thus, the locations that produce the air pollution are not usually affected. The deposits are taken up by soil and plants in the affected locations and do their damage in very subtle ways.

But the problem is not that acid is literally raining down on us, killing fish or burning holes into leaves. "Most people think it's just acid," said Brand Niemann, special assistant and program analyst on the acid rain staff at the EPA. "I get calls from [experimenting] school students asking, 'How much acid do I have to put into this goldfish bowl to kill the goldfish?' And I say, 'Please don't do that, you don't want to kill your goldfish, and it doesn't represent what happens in nature anyway.'"

KELLY SHEA

Meise exits Banyan, enters CEO job search

BY PATRICIA KEEFE
CW STAFF

WESTBORO, Mass. — In a surprise move, Richard G. Meise, president of Banyan Systems, Inc., resigned last week to "seek a new opportunity in high-technology." Company founder and Chief Executive Officer David Mahoney will assume the presidency and said that he has no immediate plans to find a replacement for Meise.

Meise is leaving because he wants to be CEO of a company, said Mahoney, who stressed that the parting was amicable. The announcement follows the network software company's April disclosure that it plans to go public later this year if market conditions are deemed suitable [CW, April 17].

Mahoney does not expect Meise's departure to impact his initial public offering (IPO) plans: "An IPO is based on execution,

employees and annual revenue of \$10 million to 430 employees and a first-quarter run rate of \$80 million annually.

Meise will remain with Banyan in a consulting capacity "while pursuing new opportunities" in high-tech. His departure has touched off a small realignment of duties within the organization.

Roger Weisman has been promoted to senior vice-president

of operations and will take on customer service, financial administration and manufacturing duties. Jack Kay has been promoted to vice-president of sales operations and will add reseller management to his field sales responsibilities. Engineering has been combined with product development and will be headed up by James Alchin, vice-president of product development.



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EDITORIAL

Tipping the scales

SUPPOSE YOU WANT to hire programmers at two sites: one in Marin, Calif., where an average house sells for \$350,000, and one in Tupelo, Miss., where a house sells for, well, a whole lot less than \$350,000. You would not offer the same starting pay for each job, would you?

The federal government does, and it has been for some time, too. As a direct result of this antiquated pay scheme, where workers of similar grades are paid identically no matter where they live, the government is finding it hard to hire in major metropolitan areas.

So it is welcome word indeed that the General Services Administration (GSA) is finally studying locality pay, the euphemism for compensating people differently for the same job done in different parts of the country. Work on such an obvious and sorely needed concept cannot proceed quickly enough.

Federal officials admit that there is no governmentwide effort today to attack the acute recruitment problems facing the various agencies. *Computerworld's* annual salary survey shows government workers on the bottom rung of the IS pay scale, trailing their counterparts in the private sector by as much as 50%. The undifferentiated geographical pay scheme adds significantly to the problem.

But the inability of the federal government to staff up, due in great measure to inadequate pay scales, has a far-reaching impact. For one thing, the worker-starved feds have embraced systems integrators in a big way. But implicit in making systems integration really work is a solid base of contract management potential at the job site. With only a skeletal, itinerant IS staff, a less-than-scrupulous systems integrator can easily hoodwink the agency where it is working.

However, if the site has been plagued by turnover and a basic inability to attract top-flight people as a result of low pay, as is the case in metropolitan areas, what does that say about contract management potential? Not much, we're afraid to say.

Further, consider the data the feds are charged with processing and protecting. The Social Security Administration, the Internal Revenue Service, the National Aeronautics and Space Administration and others process highly sensitive, often volatile, data. It is certainly in the taxpayers' interest for these agencies to attract and keep the best talent available. To do this, however, the agencies must be able to compete more effectively with the private sector for that talent.

Instead, the system today has federal managers scrambling to devise ways around cumbersome personnel policies. Not surprisingly, the most effective methods are those commonly in place in private companies, such as referral bonuses.

Now that the problems and some of their solutions are so apparent, we urge the GSA to move swiftly to mitigate the growing federal hiring dilemma.



LETTERS TO THE EDITOR

That's the ticket

If more MIS executives follow the lead of your Special Report examples [CW, April 10], Electronic Data Systems Corp. will have no shortage of new clients. As a technology consultant, I can assure you that unless more MIS executives learn what their job really is, they will unwittingly roll out the red carpet for a cost-cutting service bureau.

There is no excuse for this. Senior MIS people have the opportunity to define their departments as essential to the future of their companies. Instead, many see themselves as technical managers, keeping the shop running smoothly while pinching every penny on its way out the door. Only one of your Special Report articles focused on what is really important today.

As global competition grows, only two things matter to senior management: one, how can our computer equipment improve the product so the customer will pay more for it? and two, how can we deliver the products to the customer better than our competitors?

MIS executives who can deliver on these two areas can write their own tickets; those who cannot will be competing for fewer and fewer jobs at firms less able to compete successfully in the marketplace.

*Craig A. McMillan
Information Technology
Consultant
Tacoma, Wash.*

Another innovator

It's a shame that you did not have time to investigate some of the other organizations that are providing innovative capabilities within the New York State De-

partment of Health [CW, Special Report, April 10]. One such example is the Management Information and Analysis Group (MIAG) of the Office of Public Health.

MIAG's Dar Chen has written Geostat, a personal computer-based system that virtually insulates a person making a geostatistical inquiry against mainframe data from the technical intricacies of the task. Based on information derived from a series of questions, Geostat produces complete JCL and SAS statements to satisfy the inquiry, moves the job to the mainframe and runs the job.

The results from the mainframe are then processed further by Geostat to provide fully leveled tables and a file that imports directly into Atlas Graphics to produce custom maps suitable for small-area analysis. The tables can be examined interactively within Geostat, and all of the output (tables and maps) can be easily incorporated into reports. Chen's system also provides surveillance capabilities by allowing areas falling outside of user-set limits for one or more health indicators to be geographically pinpointed.

MIAG also provides interactive database applications that are integrated with desktop publishing capabilities. The mix of software being used allows you to query its database and finish a high-quality report within 15 minutes. Work is being done to include the automatic generation of tables and graphs and incorporate these into finished documents.

*Larry M. Litwin
Research Scientist
New York State Department of Health
Albany, N.Y.*

A different sort

I agree with "In the CICS world, it takes all sorts" [CW, April 10]: Real-time sorting in CICS is not something to avoid. However, there are other technologies besides VSAM alternate indexes for performing this task, and these technologies are more efficient and easier to work with.

The standard Cobol Sort verb, which is itself a blessing, uses I/O-based vehicles to maintain the data during sorting. Normally, this is not a significant problem if one or two on-line transactions are requesting a re-ordered screen of data. However, if a few hundred users are attempting to do this simultaneously, this technology could present a serious detriment to on-line response.

To improve an on-line decision-support dialogue, you need to review information displayed on previous screens. This involves redisplaying previously fetched information. You need to have different views of that same data, and the information must be summarized through one of these views.

The solution presented requires rereading the database and then presenting the data back in yet another sort order. This is only compounded by more users needing more views.

*William P. Olders
President
Data Kinetics Ltd.
Ottawa, Ontario*

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

IBM's selfish standards stance

IBM WATCH

PHIL DORN



In the wondrous world of standards, IBM has long managed to keep both feet firmly planted in midair. When it suits its purposes, IBM is an outspoken supporter of international standards. On other occasions, IBM can be a notorious foot-dragger capable of creating objections out of thin air.

MIS managers concerned with IBM's long-term strategy regarding today's standards controversies should keep this in mind and judge the company by its past behavior.

In computing prehistory, several critical standards came directly from IBM with only minor cosmetic changes by the official committees. The size of a punched card and the characteristics of half-in. magnetic tape were IBM standards readily adopted by the industry.

A bit later came Fortran, originally an IBM proprietary language, donated royalty-free to the user community. Why? Did anyone believe there might be value in selling licenses to use Fortran? Not in those days. The cynical view is IBM was willing

Dorn is president of Dorn Computer Consultants, Inc. in New York.

to give away Fortran because the language sold hardware.

In the early 1960s, there was a major fight over character-set definitions. IBM dug in its heels and fought what we now know as the ASCII character set.

When IBM fights, it fights hard. Customers were given IBM's EBCDIC alternative to ASCII and IBM systems seemed to have a great deal of difficulty with processing ASCII characters.

Still the same

The early 1960s were a long time ago, but IBM hasn't changed all that much when it comes to standards. The company still pushes for some standards, rides along on others and does everything it can to delay those which do not fit IBM's master game plan.

Despite IBM's alternating approach to standards, the company inevitably receives the majority of media attention for fighting rather than promoting them. This leads to a misperception in the user community that IBM is always antagonistic to all standards.

Of course, this blanket negativity isn't true. Can IBM be obstructionist? Will they use the standards process to support their own agenda? Has standardization become politicized? Yes, yes and yes. Does this surprise anyone?

Is IBM acting any differently

than other vendors in the midst of a standards battle? Not really. All vendors come to the standards table with a lengthy laundry list of what they want to accomplish and how best to thwart others.

They also try to pack language standards with features already implemented on their systems. Removing functionality from a standard that your competitors have already created can be a source of constant enjoyment for a computer vendor.

This conflict is sometimes difficult for IBM to face because of its past record of offering proprietary products to standards makers and seeing them become the accepted standards for the industry. For example, the company volunteered the once proprietary Fortran and PL/I languages to the user community and handed SQL over to the industry at a very early stage in the standards process.

But this approach did not work with a free offer of LU6.2 to the International Standards Organization (ISO) committee, which was trying to finalize the Open Systems Interconnect seven-layer model. The committee said thanks but no thanks, leaving IBM in stunned disbelief. Since then, IBM is awakening to the fact that its offerings may be rejected just because they come from Armonk rather than accepted for that reason, as they were a short time ago.



BILL RUSSELL

This realization will help IBM face today's major standards questions and deal with the power of new user and vendor standards groups such as X/Open, the Open Token Foundation and the MAP/TOP User Group.

In the past, standards arose under the protective wing of ANSI, whose bureaucratic procedures were aimed at a slow, orderly process. Now, however, impatient new groups are each pushing their own views. ANSI does little save retroactively blessing the efforts of others and submitting the newly hatched U.S. standards to the ISO for international consideration. It is a new game, the rules have changed. Nobody, including IBM, knows what the future holds.

In the meantime, IBM is focusing on a number of conventional standards issues. First and foremost is the horribly unnecessary fight between Unix Inter-

national vs. the Open Software Foundation. How many users care if their copy of Unix is based on AT&T's System V or IBM's AIX? Does any user care about imaginary evils stemming from the AT&T-Sun relationship? One has to be very doubtful.

At rock bottom, IBM's standards efforts are really quite simple to explain. IBM does what it has to do to further its own business interests. IBM is not involved with the standards process because it is a good thing to do or as a way of improving the public welfare.

IBM will continue to take three views of standards: pro when it enhances its ability to sell products and services, neutral when there is no special marketing impact and strongly negative when what is being done goes against their plans.

Come to think of it, isn't this the way all vendors should approach the standards world?

then need to follow through with the market awareness and customer concern that it was unable to adequately harness on the last round.

This means focusing its product development and marketing resources on what customers want and are willing to buy in volume rather than enthusing over neat technology before Wang — or customers — are ready for the market. It also means tearing down internal political barriers so that technologies that belong together come together on a timely basis and offer Wang customers the significant benefits they will need to see to select and continue to select a Wang relationship.

It also means understanding that some markets — being a mainstream PC vendor, for example — just aren't going to be available, and that Wang may not have the resources or the time to try that one again.

The wheel turns, and sometimes old companies get a new chance. Wang still has the technological basis for future success, but it will have to work hard to keep its aging customer base and to attract new customers for the new products it wants to bring to the marketplace.

Wang won't give up just yet

AMY D. WOHL



In the computer industry, things often run in cycles. Wisdom, therefore, can mean identifying which cycle you're in and how it will be the same or different this time around.

Companies can get lucky by being in the right place in a cycle or very unlucky by choosing the wrong game to play or the wrong time to play it.

For the past few years, Wang Laboratories has found itself in the midst of just such a situation.

On the money

Wang was either very lucky or very smart in the mid-1970s. With nearly perfect timing, they provided a first-class solution for stand-alone and multiuser dedicated word processing just as the market for such products took

off. One could make a strong argument that it was Wang's excellent word processing products as well as its aggressive and attractive pricing that prodded a previously smaller market to much greater heights.

But in the early and mid-'80s, Wang stubbed its toe several times in a row.

As Wang grew rapidly, sometimes at a seemingly exponential rate, service lagged badly. Wang seemed to have made a decision to go for flat-out growth and catch up on service later, resulting in a black eye that proved slow to mend. As Fred Wang has said, you can build a reputation over years but hurt that reputation in a few minutes.

As customers looked beyond

word processing to office automation, they often looked to data processing rather than word processing vendors as technology partners. DEC was often the beneficiary of such thinking and Wang the loser.

As word processing shifted from dedicated word processors and terminals on multipurpose minicomputers to a largely personal computer-based business,

Wang missed the boat several times.

Like nearly every established DP vendor, including DEC, Hewlett-Packard and Data General, Wang attempted to build a "better" personal computer than IBM and failed to recognize that complete compatibility was an absolute requirement for market success.

Like most successful word processing vendors, Wang chose to protect its highly profitable dedicated hardware-bundled-with-software business by offering only limited versions of its word processing software for the PC market. Later, Wang offered a software-only compatible version of its product for the PC, but the major marketing opportunity had by then passed on to more graphical products with friendlier interfaces.

The reverberations of those mistakes and missed opportunities have yet to be overcome. The word processing market changed permanently from a focus on dedicated specialty products to an integration with other forms of business DP and a focus on PC platforms. As a result, other vendors have taken Wang's once preeminent position.

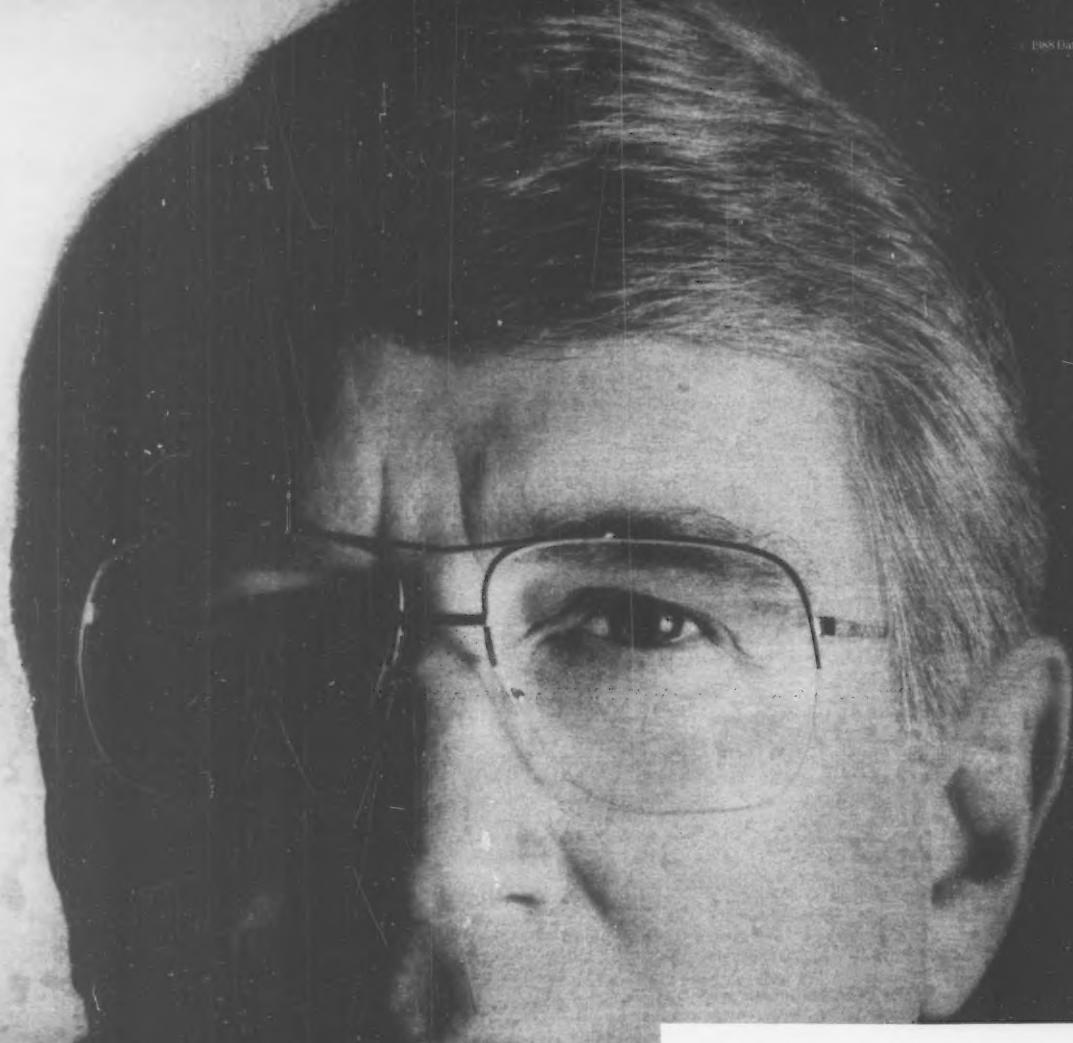
Throughout the latter part of

the '80s, Wang has hovered at or near a break-even profitability point. Revenue has continued to grow, albeit more slowly, but profits have proved elusive. Normally, a publicly held firm in an age of takeover would be vulnerable (recent rumors had Xerox interested in merging), but Wang's special stock classes insulate it from an unfriendly takeover, and only a Wang family decision could cause a change here. No such decision seems likely.

Instead, Wang has looked once again to its strength — technological innovation — to bring it back to the center of the computer marketplace. Led by the personal efforts of Dr. An Wang, the firm has recently unveiled a series of graphically oriented technological advances. In addition to its optical-disk-based document storage system, it has gotten significant acclaim for its innovative Freestyle graphical interface.

Innovation is key

If Wang has a future in the mainstream of office computing — and by heritage and preference, this is where it wants and needs to be — it will be through technological innovation that it will regain market attention. It will



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SOFT TALK

Timothy Bryce

Many words, no solution



The final draft of a standard for an Information Resource Dictionary System (IRDS) has just been published by the International Standards Organization (ISO). The standard attempts to define a general framework for an IRDS, or repository, in terms of content and functionality. It represents the culmination of several years of effort and a considerable investment by countries from around the world participating in the program. Unfortunately, the standard misses the mark. Instead of offering innovative ideas on the subject, it is simply a rehash of old data dictionary technology.

The standard, which was heavily influenced by the American National Standards Institute (ANSI), is laced with technical programming jargon, making it extremely cryptic. Instead of offering insight into the purpose and benefit of having an IRDS, the standard is consumed with detailing the physical architecture of the product. In other words, ISO is trying to specify a solution without truly understanding the problem first.

Although there are some

Continued on page 28

Evading supercomputer prices

Users can have their cake and eat it too with augmented mainframes

ANALYSIS

BY JAMES DALY
CW STAFF

When is a supercomputer not a supercomputer? When it's a mainframe that has been tweaked to perform like a supercomputer.

With the demand for high-performance computing expected to swell dramatically by the early 1990s, analysts say that users desiring access to tremendous general-purpose computational power without the cost normally associated with that privilege will increasingly turn to

mainframes with vector capabilities to satisfy their high-performance thirst.

Dataquest, Inc., a San Jose, Calif., research firm, predicted that the worldwide installed base of mainframes with vector processing features will increase nearly twice as fast as regular supercomputers, from 190 in 1986 to 1,022 by 1991.

Additionally, interest in augmented mainframes could be fueled further if industry speculation that Digital Equipment Corp. is coming out with a vector facility later this year to satisfy the demand of high-end VAX users proves true.

But a semantic battleground is already forming — namely, is a modified mainframe considered a supercomputer? "I'm still asked when IBM will get into the supercomputer business; we're there," said Carl J. Conti, IBM senior vice-president and general manager. IBM offers its 3090 with vector attachments.

Others disagree, claiming that firms like IBM are trying to stand in the shadow of their more powerful cousins. "IBM just doesn't have the speed of the Cray, and that's what supercomputers are all about," said Sid Karin, director of the San Diego Computer Center, which recent-

Firm climbs to new IBM platform

BY ROSEMARY HAMILTON
CW STAFF

CHICAGO — While there is some debate among users about whether a move to an IBM 3090 S model is currently worth the cost and effort, at least one user sees this step as necessary to keep up with IBM.

Arthur Andersen & Co. upgraded from a 3090 200E to a 300S last month and reports smooth sailing so far. Lee Szymonik, deputy director of operations and production at the Big Eight accounting firm here, said the S upgrade was important because "we wanted a platform for our developers that was the latest level."

Szymonik said his group cur-

rently has plans under way for a conversion to IBM's MVS/ESA operating environment in late 1989.

The programmers have several projects to develop applications for IBM's DB2 database management system. There are plans to set up a system-managed storage environment under ESA and to implement the IBM Processor Resource/Systems Manager feature, known as PR/SM.

With so many new areas to explore, Szymonik said it was critical to do so with IBM's latest hardware.

"With ESA and S models, the two working together just give you a better machine," Szymonik said.

Last year, Szymonik's staff had determined a need for a 3090 Model 300-class machine because of the growing programming work load. They had decided to go with a 300E, and IBM announced the S models in July.

The S model, with its improved cycle time, could offer better response time for programmers, Szymonik said. That, combined with Szymonik's wish to have the latest hardware platform, pushed him toward an S model decision.

Once IBM threw in some price incentives, the decision was finalized, Szymonik said.

Szymonik reported a trouble-free upgrade that took place during the first weekend in April and

Vector growth spurt

Installation of mainframes with vector facilities is growing while effective costs are going down

Estimated worldwide installed base

	1986	1991
Supercomputers	228	760
Mainframes with vector facilities	190	1,022

Estimated sales*

	1987	1991
Supercomputers	\$1B	\$2.9B
Mainframes with vector facilities	\$76M	\$116M

*In 1987 dollars

SOURCE: DATAQUEST, INC.

CW CHART: JOHN YORK

ly placed an order with Cray Research, Inc., for a \$25 million Y-MP. In contrast, a high-end IBM 3090 Model 600S equipped

Continued on page 28

involved adding what he called another processor wing to the 3090 complex. In addition to the new processor cabinet, the water supply and power supply had to be increased. A microcode tape had to be loaded to tell the system of its changed configuration.

The software environment required no changes, he added.

Szymonik said the S model upgrade came in on schedule, despite IBM's announcement of S model delays earlier this year.

Inside

- Jack Murray sees benchmark auditing as no trifling matter. Page 26.
- IBM sponsors supercomputing applications contest. Page 28.

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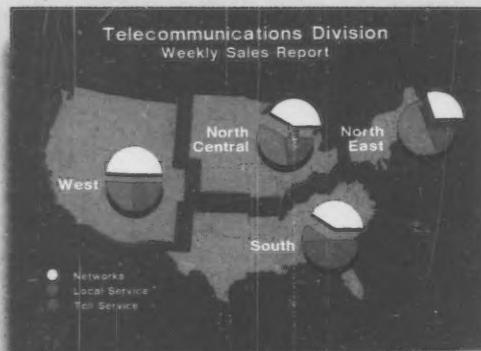
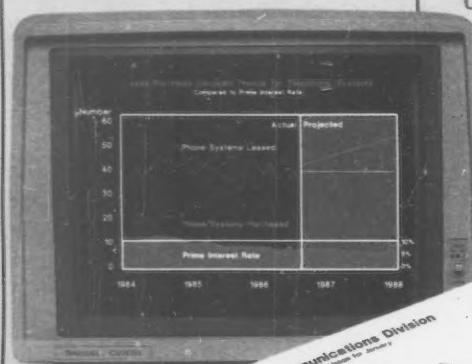
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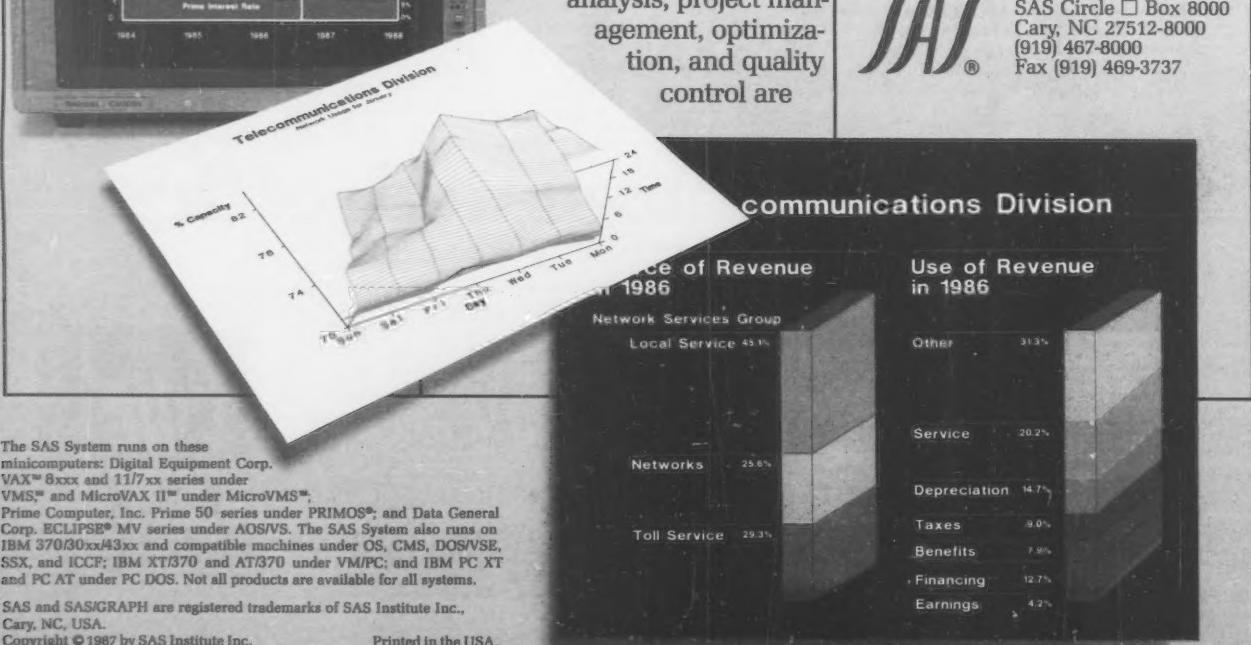
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31. Dir. Mgr. Suprv. of Programming
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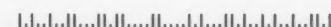
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CLX series extended by Tandem

BY J. A. SAVAGE
CW STAFF

CUPERTINO, Calif. — Tandem Computers, Inc. last week extended upward its midrange fault-tolerant on-line transaction processing computers with the addition of four models.

The company claimed that the new models improve price/performance at the high end of the CLX minicomputer line by 40%. It also lowered the prices on its 2-year-old CLX 600 series systems.

The new CLX 700 family offers four models consisting of two to eight processors and ranging in price from \$105,000 to \$405,000, with a base configuration of 16M to 64M bytes. The earlier series had one to six processor configurations. Upgrades are available.

The company claimed that the new models include larger main memory, up to four times the maximum amount of disk storage and four times the amount of I/O capacity over the 600 series. Prices for the older models have been reduced by 7%, according to the firm.

While CLX has been around since late 1987, software to optimize multiprocessor systems was not available until late last year. Since then, CLXs have accounted for about one-half of the firm's new accounts and about 15% of its total revenue, according to analyst John Jones at Montgomery Securities in San Francisco.

Tandem rates its CLX 620 at five transaction/sec. for \$79,000 and its CLX 780 at 29.6 transaction/sec. for \$405,000.

DEC strengthens prison walls

VAX clusters enforce order at Virginia Department of Corrections

ON SITE

BY SALLY CUSACK
CW STAFF

RICHMOND, Va. — Commonwealth of Virginia Department of Corrections (DOC) employees were bogged down in spring 1985, using IBM Selectrics and manual methods for typing and creating spreadsheets. Only 3% of the office work load was automated, and with 10,500 DOC employees, things got a little messy.

Now, a cluster of Digital Equipment Corp. VAXes is humming away at the DOC's headquarters here, including a VAX 8550 and a VAX 8650 for office automation applications. A VAX 8200 is responsible for inmate payroll incentive programs, and the department is in Phase II of a three-phase plan to fully automate its operations by 1990.

This high-tech takeover was engineered by John McCluskey, chief deputy director at the

DOC. "When I arrived in May 1985, there was no way to get a report to the governor's office in 20 minutes," McCluskey said. Vaxmates running MS-DOS and Microvax systems running DEC VMS are now scattered throughout the organization and will link with the cluster by the end of Phase III.

DOC tour

Assessing the DOC's technological needs was not easy because its facilities are spread over 40,815 miles. There are 13,000 inmates incarcerated in 16 major prisons and more than 100 other units, including juvenile and probation centers and parole offices.

"With a clientele of almost 61,000, our people needed to communicate without jumping through hoops. Our plans had strict networking criteria," McCluskey said.

The needs assessment report, completed in 1986 by a committee of six state agency employees and an outside con-



DOC's McCluskey executed the VAX takeover

sulting firm, produced three mandatory requirements: office automation, decision-support tools and adequate data processing capabilities.

DEC won out over several vendors bidding on the contract, including IBM, Data General Corp. and Hewlett-Packard Co. McCluskey felt DEC had the ex-

isting technology for a reasonable price.

The bulk of the costs were in hardware. Phase I established the cluster for central office requirements and required 400 terminals and 146 Vaxmates placed throughout the system. They are currently operating in a stand-alone capacity for word processing and spreadsheet applications and will be on-line by Phase III.

A VAX 6310 is on order to automate manufacturing reports. Inmates manufacture all furniture required by state and local agencies as well as license plates, said MIS administrator Frank Zera. He said that inmate records and the employee payroll are handled by an IBM 3090 at a data center shared with other state agencies.

To date, 13 of 22 Microvaxes planned for office automation activities are installed at four regional offices and nine major institutions. These will connect to the cluster over Decnet and access the IBM mainframe with an IBM Systems Network Architecture gateway. By the end of Phase II late this year, 50 DOC facilities with 762 terminals and

Continued on page 28

Sybase working on its RDBMS text and 'image'

BY STANLEY GIBSON
CW STAFF

Sybase, Inc. recently added text and image data types to its Sybase relational database management system in a move that could boost the firm's standing among workstation users.

Sybase said it now offers storage capability of up to 2G bytes, a size that reportedly can accommodate a two-million-page book

or 2,000 pictures. However, text search and retrieval was not included. For those capabilities, Sybase suggested purchasing Verity, Inc.'s Topic package. The two firms said they have entered a strategic relationship under which they will recommend each other's products.

Sybase also announced several new utilities to manage the large amounts of data involved in text and image applications.

"The whole idea is to support text and image in a database rather than in an outside file while using the database as an index," said Richard Sheffer, Sybase marketing manager.

Growing strong

"With this announcement, they get stronger in the workstation market. This is really for CAD/CAM," said Shaku Atre, president of Atre/Computer Assistance in Rye, N.Y. Although Sybase has tried to make a big impact with on-line transaction processing, concentrating on the workstation market is the firm's best chance for success, Atre claimed.

In the Sybase implementation, the text data types are printable character strings and image data types are binary data. Sybase text and image data types can store very long data strings as a single instance of a data value or field. Each row in a table can contain up to 250 text or image fields.

Sheffer suggested the system could be used in storing news stories received over wire services, archiving medical images and storing business documents or engineering drawings.

The text and imaging capability is offered as a normal upgrade to Sybase users and is not charged separately, Sheffer said.

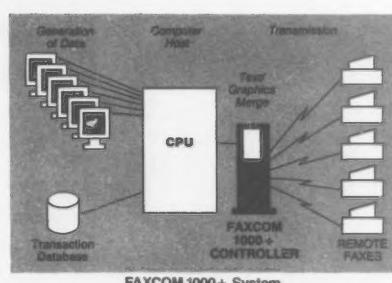
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Auditor keeps benchmarks honest

BY STANLEY GIBSON
CW STAFF

BURLINGTON, Mass. — Sometimes, you have to dig pretty deep to get to the truth.

Maybe that explains why Jack Murray, director of national software testing services at Peat Marwick & Co. here, insisted on inspecting the sub-floor wiring at a client's site.

For Murray, auditing benchmarks is not a job to be taken lightly. It demands that the right questions be asked and the right wires be checked before he can put

his firm's name on an attestation report. Peat Marwick has been testing systems and software since the 1970s. In 1982, it established a testing center here. Much of Peat Marwick's recent work has been performing Debit/Credit test audits for Digital Equipment Corp. at its Marlboro, Mass., facility.

With the recent spate of benchmarking showdowns, qualified auditors such as Murray have been in demand. Their audits enable a vendor to make a performance claim with a clearer ring of truth. But signing their name to a document also puts auditors on the spot. Customers hold

them accountable for the veracity of the reports.

Recently, DEC published results audited by Peat Marwick that showed IBM 9370 systems performing at 33% to 50% the speed that IBM attained. IBM's tests were observed by Tom Sawyer at Codd & Date Consulting Group. Both IBM and DEC's tests were implementations of the Debit/Credit benchmark.

For Murray, the key is not whether the testing procedure is the most appropriate for the processors but simply whether the test results can be duplicated. "We would not issue a report on something that was

not repeatable," Murray said.

Reports may likewise be withheld if a vendor decides to abrogate its contract with the auditors. This has happened in the past when Peat Marwick has told clients it could not file a favorable report.

Despite the variances possible with Debit/Credit, Murray is upbeat about the benchmark's increasing value and acceptance. "Debit/Credit is not a panacea, but the trend is toward some work load standards," he said. He praised the work of the Transaction Processing Performance Council (TPC), which is trying to define Debit/Credit guidelines. Murray recently addressed a meeting of the group.



JOHN OWENS
Marwick's Murray takes benchmarks to heart

He said he is optimistic that other benchmarks will be established as well. In imaging, for example, he said a scheme could be devised in which images per second could be measured. Quality and size of image would be major variables in the equation, he said. Speech processing, he said, is also in need of a benchmark.

In other areas, it is less likely that a standard benchmark can be achieved. "In some realms such as desktop publishing, it is hard to establish a discrete repeatable process," he said.

Murray feels strongly that the tide of more fair testing cannot be rolled back. "Forces are pushing toward an openness that's critical to our society getting through this next period of the information age," he said, adding, "I've always believed that healthy, open competition does not stifle creativity."

Nonetheless, he stressed — as do many familiar with benchmarking — a benchmark review or audit can never be the sole determinant in a buyer's decision. He says a user's specific application must be given more weight.

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TBS Software Inc.
249 Tempo Avenue
North York, Ontario
Canada M2H 2A9
(416) 221-5140

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Evading

CONTINUED FROM PAGE 23

with six vector facilities costs \$14.6 million.

Are there really nonoverlapping classes of equipment? "Not really," said Peter C. Patton, director of the technology assessment superperformance computing service at Dataquest. "These strata are convenient for classifying, analyzing and forecasting growth. Not only do some systems overlap, the class boundaries are arbitrary."

In simpler times, supercomputers were often defined as tremendously powerful machines capable of processing 100 million floating-point operations per second (MFLOPS). Most supercomputing was done for the federal government and involved high-speed number crunching for defense and intelligence agency use.

Since the early 1980s, however, a rapidly growing appetite for high-performance computing has developed in the private sector. "Supercomputing has spread from one industry to another like a benign virus," read a recent report issued by Computer Technology Research Corp., a Patchogue, N.Y.-based firm.

The trouble was that machines produced by firms such as Cray and Control Data Corp. could cost upwards of \$20 million. In the mid-1980s, an answer arrived when IBM, Unisys Corp. and National Advanced Systems announced that some of their machines could be upgraded with vector attachments, thus achieving su-

percomputer speed.

Vector processing differed from the supercomputing method of scalar processing, in which machine instructions operated on single pairs of data. During vector processing, the same operations can be performed on many pairs of data with one machine instruction, for more efficient use of the instruction element.

While vector machines were not without drawbacks — critics cited relatively slow clock rate and MFLOPS numbers — they offered substantial computational power for often underfunded research operations or corporations that had a large IBM installation used primarily for other purposes.

While some early observers looked at the vector machines as a halfway solution, few feel that way now. Viktor Decyk, a plasma physicist from University of California, Los Angeles (UCLA), wrote recently in the UCLA magazine *Perspectives* that the 3090 vector is "in some ways even superior" to machines such as a Cray. Decyk pointed out that the memory available on a single-user job on the UCLA 3090 is about five times the memory available on some Cray models.

The battle between supercomputer and mainframe manufacturers promises to get hotter. While most observers generally agree that massively parallel systems will be the eventual direction of high-performance computing, the fight over a billion-dollar pie will remain.

Still, through it all, many users profess a single overriding belief: Call it what you want as long as it gets the job done.

HARD BITS

In search of super innovation

Put your thinking caps on. IBM is sponsoring a competition for supercomputing applications that will offer \$200,000 in prizes. IBM is looking for applications in physical sciences and mathematics, engineering, life and health sciences and social sciences. First prize in each category is \$25,000. The competition is open to developers in both the U.S. and Canada, IBM said.

NCR Corp. has decided to put its disaster recovery service on wheels. The company recently introduced a disaster recovery van, which is equipped with communications lines, cables and backup hardware, is set up like a data center and can be dispatched to customers in the event of a disaster. The disaster recovery van can be transported via truck or airplane and operate close to a customer's site. Phone lines at a disaster site can be routed to NCR's disaster recovery facility in Dayton, Ohio, via connectors in the van.

Data Vault Corp. in Needham Heights, Mass., said work on its new data storage facility, which is a former Nike missile site, is complete. The \$800,000 restoration project gives Data Vault more than triple the capacity it previously had. The southeastern Massachusetts location will enable the organization to expand beyond the Boston area, to which it had previously been restricted because of its two-hour data delivery that it guaranteed its customers.

Interactive Systems Corp. announced that it plans to port AT&T's Unix System V, Release 3 to a hardware platform developed by three Japanese semiconductor manufacturers, including Hitachi Ltd., Fujitsu Ltd. and Mitsubishi Electric Corp. The platform, based on 32-bit microprocessor technology, uses the Tron concept. Tron, or The Real-Time Operating System Nucleus, is an open-systems concept developed at the University of Tokyo.

Bryce

CONTINUED FROM PAGE 23

grandiose statements conceding that the intent of the IRDS is to control and document an enterprise's information resources, the standard falls short of defining information resources with any precision. This would have been the true benefit of the standard; a set of information-related objects and a defined set of relationships that could be universally applied in any application or field of endeavor. Instead, the standard cops out to the concept of "extensibility," which allows any kind of component or relationship to be defined in the IRDS, thus prohibiting consistency among IRDS users. This is progress?

The purpose of the IRDS should be to inventory, document and control all of the resources required to produce information. When standardized and controlled, these resources can be shared and reused by the corporation, not just a single user or application. Control over these resources also permits the manipulation of these resources to produce information.

There are three fundamental types of information resources: data, systems and organizational components. When defined and cross-referenced by an IRDS, the result is a working model of the enterprise. From this "view from 50,000 feet," we can visualize how an enterprise is organized and operates, including what data and systems are required and who uses them.

In addition to stipulating the types and relationships of information resources, the IRDS should have been concerned with resource classification and control techniques. These are areas that were surprisingly omitted from the standard. Instead, they simply focused on the rudimentary features and functionality that an IRDS should possess — i.e., component definition, access control, query/reporting facilities and import/export facilities.

Passage of the standard was far from unanimous. Proponents of the standard were the U.S., Canada, Denmark, Fin-

land, Hungary, Italy, Portugal and the Netherlands. However, it met with resistance from such heavyweights as Japan, Germany and the UK, which voted against the standard.

In the final analysis, the IRDS standard represents another instance where a beautifully simple concept has been complicated by technicians. Although the IRDS standard may offer some technical insight into the internal workings of a data dictionary, it falls short of providing a viable solution for managing information.

The IRDS is a vital part of an information resource management environment. The ramifications of accepting a superficial standard are simply far too great. Unless this draft is amended, this is one vendor of an IRDS system that has no intention of observing the standard.

Bryce is the director of marketing and customer services at M. Bryce & Associates, Inc. in Palm Harbor, Fla.

DEC

CONTINUED FROM PAGE 25

139 printers will be on-line.

Phase III will automate the probation and parole programs as well as the juvenile service units, with an additional 626 terminals, 16 Microvaxes and 145 printers, Zera said.

McCluskey said the DOC is happy with DEC. "Equipment is brought on-line smoothly. There is no 'we have good news and bad news' approach to situations," he said.

Decnet ties together multiple systems at a single site. Vaxmates will be able to communicate over 2,400 bit/sec. error-correcting leased lines with the host cluster by passing through the Microvaxes running Datastorm Technologies, Inc. Procom file transfer software and Polygon, Inc.'s Poly-Com terminal emulation packages.

Vaxmate users who do not have access to a Microvax can communicate with the cluster via 2,400 bit/sec. leased lines. No network management products have been purchased.

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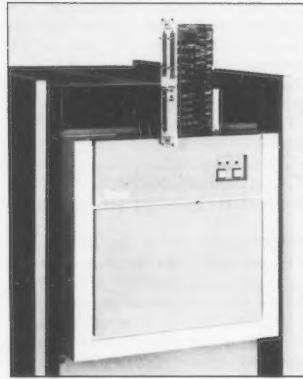
NEW PRODUCTS — SYSTEMS

Data storage

Ibis Systems, Inc. has announced Triad, a parallel-transfer disk storage subsystem for VME-based workstations and high-performance computer systems.

The product comprises a high-speed, 32-bit Motorola, Inc. VMEbus controller that resides in the host; the Ibis 1012 12M byte/sec., 1G-byte disk drive; and a proprietary software device driver for Unix and other VMEbus environments, the company said. The product is priced at \$34,420, and OEM discounts are available.

Ibis Systems
5775 N. Lindero Canyon Road
Westlake Village, Calif. 91362
818-706-2505



Ibis Systems' parallel-transfer disk storage subsystem

IPL Systems, Inc. has announced a data compression feature developed for mainframe users of its IPL 6860 cartridge tape subsystems.

The IPL 6860 data compression feature enables the 6860 to increase data storage capacity from 2.3G bytes to more than 4.5G bytes on a single 8mm cartridge, according to the vendor. The product reportedly utilizes the IBM Systems Network Architecture compression algorithm and is priced at \$6,000.

IPL Systems
360 Second Ave.
Waltham, Mass. 02154
617-890-6620

Sea Change Corp. has announced two storage enhancement products for NCR Corp.'s Tower family of Unix-based computers.

The EXB 2/3 External SCSI Enclosure is reported to be a complete enclosure kit for high-capacity small computer systems interface storage devices. It offers a fully configured disk capacity of 2.8G bytes, regardless of which Tower model is used, the vendor said. It costs \$2,113.

The EXT 230 SCSI tape system external unit reportedly houses an 8mm helical scan technology tape drive and has a maximum capacity of 2.3G bytes. The product was designed to provide backup capabilities for the disk subsystem and carries a price tag of \$1,294.

Sea Change
Suite 38
1100 Central Pkwy. W.
Mississauga, Ont. Canada L5C 4E5
416-272-3881

I/O devices

A midrange, duplex laser printer has been announced by NBS Southern, Inc.

Designated the 3840D, the device reportedly offers 6M bytes of memory and 300 dot/in. resolution. Output capabilities are rated at 40 letter-size image/min., with a duty cycle of 200,000 image/month, according to the company.

The printer interfaces to IBM mainframes, mini and personal computers, and interfaces are available for connection to Digital Equipment Corp. VAX systems. The 3840D costs \$54,950.

NBS Southern
11451 S. Belcher Road
Largo, Fla. 34643
800-327-5602

Mitsubishi International Corp. has introduced its Super Multi-Color SPI-3 series of analog video processors.

The series was designed to enhance performance of the Shinko CHC series of A- and B-size color graphics thermal transfer printers, according to the company. By interfacing with the SPI-3, the software-driven printers can reportedly take direction from midrange computer systems, including the IBM 5080 and Digital Equipment Corp. processors. The product expands color selection to a palette of 274,625 hues, the vendor said.

The SPI-3 series ranges in price from \$6,500 to \$7,500, depending on configuration.

Mitsubishi International
Computer Graphics Department
701 Westchester Ave.
White Plains, N.Y. 10604
914-997-4999

C. Itoh Electronics, Inc. has introduced an IBM 3812-compatible model of its Megapro-Plus ion deposition printer.

The 30 and 45 page/min nonimpact printers reportedly incorporate a controller board jointly developed by C. Itoh and Creative Controllers, Inc. in Picayune, Miss. It will be available from both companies.

The printer is primarily targeted at the coaxial and twinaxial marketplace and offers a 300 by 300 dot/in. resolution, the vendor said. The unit reportedly features a rated monthly usage of up to 250,000 pages and a life cycle exceeding 10 million pages. The coaxial/twinaxial version of the Megapro-Plus costs \$18,995.

C. Itoh Electronics
2505 McCabe Way
Irvine, Calif. 92714
714-660-1421

CSPI, Inc. has announced a direct I/O interface board for the company's line of MAP-4000 array processors.

The DIO-1 is a general-purpose direct memory access interface for transferring 16-bit data words between MAP-4000 data memory and an external I/O device using either the DR11-W or DRV11-WA protocol, the vendor said. The product can reportedly sustain data transfer rates up to a maximum of 10M byte/sec. and has both single- and double-buffer data modes. Prices start at \$4,500.

CSPI
40 Linnell Circle
Billerica, Mass. 01821
617-272-6020

A multiple emulation video display terminal is now available from Link Technologies, Inc.

The 14-in. flat-screen MC2 ASCII terminal is offered in either a green or amber display, according to the company. Emulations reportedly include TVI 910/925/905/950 and ADDS V2, and the product provides 128 displayable characters, including line-drawing graphics. The unit is priced at \$409.

Link Technologies
47339 Warm Springs Blvd.
Fremont, Calif. 94539
415-651-8000

Power supplies

Viteq Corp. has announced the Mini/GP on-line uninterruptible power system.

According to the vendor, the product will configure itself to support whatever voltage is available at the wall receptacle and requires no special wiring.

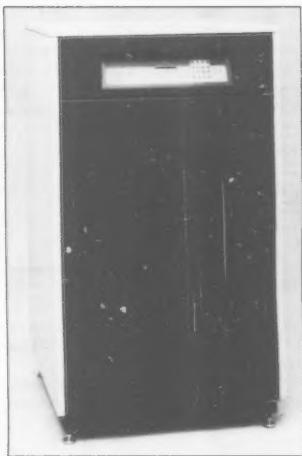
The 260-pound unit reportedly accommodates any one- or two-phase computer system up to 3 kVA and is priced at \$7,750.

Viteq
1000 Aerospace Road
Lanham, Md. 20706
301-731-0400

Decision Data Computer Corp. has announced the 5955 UPS, an on-line uninterruptible power system designed to provide continuous and emergency backup power to high-end IBM System/38 and IBM Application System/400 computers.

Two 5955 modules supply 37.5 or 56.3 kVA of continuous power and up to 40 minutes of emergency backup power, the company said. The unit reportedly measures 32 by 32 in. and is 45 in. high. Prices start at \$32,600 for the 37.5 kVA version and \$38,600 for the 56.3 kVA module. There is no charge for vendor startup.

Decision Data
100 Witmer Road
Horsham, Pa. 19044
800-523-5357



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NEW PRODUCTS — SOFTWARE

Database management systems

Release 2.0 of DB Excel DDL Manager, an IBM DB2-based repository software tool that supports DB2, IMS and record layout generation, is now available from Reltech Products, Inc.

The product is compliant with IBM's Systems Application Architecture and generates full IBM Data Definition Language syntax from entity definitions in the DB Excel repository, the vendor said. Software prerequisites are IBM's DB2 Versions 1.3 or 2.1 and ISPF. A single mainframe CPU license for DB Excel DDL Manager costs \$40,000.

Reltech Products
Suite 5700
Flint Hill
3211 Jermantown Road
Fairfax, Va. 22030
800-333-4899

Development tools

Template Graphics Software, Inc. has released Template 6.0, an enhanced version of its graphics productivity tool kit.

The product is reportedly available on IBM 370 architecture computers running either MVS/TSO or VM/CMS. It also runs on Control Data Corp., Harris Corp. and Prime Computer, Inc. platforms. The software package includes 50 device driv-

ers that support more than 200 graphics devices, the vendor said.

Pricing ranges from \$3,600 to \$60,000, depending on configuration.

Template Graphics Software
Suite 150
9685 Sranton Road
San Diego, Calif. 92121
619-457-5359

Alycon Corp. has announced a price reduction for its Regulus-386 Builder software development package.

According to the company, the product creates Unix-compatible, real-time applications on the Intel Corp. 80386-based IBM Personal Computer AT and Compaq Computer Corp. compatible systems. The software package is shipped with Metaware, Inc.'s optimizing C compiler and reportedly includes an assembler, linker and debugger. Formerly priced at \$1,500, the package is now offered at \$995. Support is provided for 90 days.

Alycon
6888 Nancy Ridge Drive
San Diego, Calif. 92121
619-587-1155

Progress Software Corp. has announced the development of an interface that allows users of its Progress 4GL to create applications utilizing data stored in Oracle Corp.'s Oracle database management system, the company said.

The English-like syntax of Progress

4GL permits Oracle users to develop applications without resorting to a lower-level language. The Progress 4GL interface to Oracle will be sold as a front-end application development module at prices ranging from \$750 to \$130,000. Early customer shipments on Sun Microsystems, Inc., Sequent Computer Systems, Inc., Pyramid Technology Corp., NCR Corp. and Digital Equipment Corp. VAX/VMS hardware are scheduled for delivery in the third quarter.

Progress Software
5 Oak Park
Bedford, Mass. 01730
617-275-4500

Applications packages

An IBM host-based check image-capture and processing system for large financial institutions has been introduced by Cincinnati Bell Information Systems, Inc. (CBIS)

Called Image Banc, the document image management product functions as a standard application in an IBM 4381 and 3090, MVS/XA operating environment, the vendor said. The open architecture software system reportedly captures check images at high speed and digitizes and stores the information on a mainframe database. Merging and sorting capabilities are also included.

Pricing is dependent on configuration.

CBIS
851 Trafalgar Court
Maitland, Fla. 32751
407-660-8400

Computer Associates International, Inc. has announced its graphics editing and drawing software system for the Digital Equipment Corp. VAX/VMS environment.

According to the company, CA-Superimage/VAX utilizes DEC's Decwindows interface to enable graphics artists and graphics application developers to create illustrations through freehand drawing, digitalization of objects and import of graphics images. The product also provides several editing capabilities, including object mirroring and grid-snapping functions.

Pricing will begin at \$2,800. Delivery is scheduled for the second quarter.

Computer Associates
711 Stewart Ave.
Garden City, N.Y. 11530
516-227-3300

Utilities

BMC Software, Inc. has announced the 3270 Superoptimizer/VM, a software package developed to reduce outbound data streams by as much as 85%, the company said.

The product reportedly reduces inbound data streams by as much as 20% and provides data stream reductions for IBM's Eedit and VM/CMS Fullscreen application programs. A perpetual license for the 3270 Superoptimizer/VM ranges from \$7,500 to \$29,500, depending on the number of terminals in the network.

BMC Software
P.O. Box 2002
Sugar Land, Texas 77487
800-841-2031

Global Software, Inc. in Duxbury, Mass., has introduced an improved version of its UF/EISPF product for IBM's IMS DB/DC Data Dictionary.

According to the company, Release 4.1.0 provides greater speed and control while performing recursive activities through the dictionary. Users can revise and add subjects down to 10 levels within the dictionary, and the product can be used in on-line or queued batch update mode. The software package runs under IBM's MVS/XA and is priced at \$25,000.

Global Software
P.O. Box 2087
Duxbury, Mass. 02331
617-934-0949

Target Systems Corp. has enhanced its job scheduling software for Digital Equipment Corp. VAX/VMS systems.

Target-Batch now includes several additional functions, the company said, including a light bar menu interface and pop-up windows for menu and data entry fields. The program also provides variable substitution labels that allow a single command procedure to change responses to program prompts based on operator-supplied values. Target-Batch is priced from \$2,495 to 13,895 per CPU. Multiple CPU and Vaxcluster discounts are available.

Target Systems
33 Boston Post Road W.
Marlboro, Mass. 01752
508-460-9206

Computer-aided software engineering

SPS Software Products and Services, Inc. has announced that its computer-aided software engineering environment, EPOS, has been ported to the Digital Equipment Corp. VAX line of computers running the VMS 5.0 operating system.

EPOS is reported to be a project support environment that includes development and project support capabilities. Also available for VAX systems is Respec, the vendor's reverse-engineering tool.

Both products work together to automatically generate reverse-engineering of existing source code and EPOS design specifications, the firm said.

The programs run on Hewlett-Packard Co., Sun Microsystems, Inc., Apollo Computer, Inc. and IBM Personal Computer AT platforms. Pricing ranges from \$8,500 to \$70,000, depending on system and configuration.

SPS Software Products and Services
14th Floor
14 E. 38th St.
New York, N.Y. 10016
212-686-3790

Peat Marwick Advanced Technology has introduced a computer-aided software engineering tool that automates the creation of screen and report layouts.

Silverrun/SRL is reported to be a module of the company's microcomputer-based Silverrun system. The module enables developers to create screens and reports via a graphical interface and export layouts through an integrated dictionary, the vendor said.

The program runs on Apple Computer, Inc.'s Macintosh Plus and is priced at \$1,775. A version is also available for the IBM Personal Computer.

Peat Marwick Advanced Technology
Suite 2200
303 E. Wacker Drive
Chicago, Ill. 60601
312-938-5002

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PCs & WORKSTATIONS

MICRO BITS

Douglas Barney

When best is slightly less



A slightly flawed explorer. One bright spot in otherwise tough times for Lotus has been the great praise heaped on its product Magellan. It's hard to disagree with fans who say Magellan is based on a superb idea.

Unfortunately, Lotus' Magellan is only almost great.

As Lotus tells it, Magellan lets you find, view and use all the information on your personal computer. But there's always a rub.

It's not in the Lotus ads, and salespeople have probably not been briefed on this, but Ferdinand Magellan failed in his quest to find a new route to the Spice Islands and instead was killed on an island in a battle between rival Filipino groups in 1521.

I'm not sure exactly how he died, but knowing ancient weapons, I'm pretty sure it was messy.

Naturally, you wouldn't want to name the product after Columbus, since he found a continent he wasn't even looking for.

With Magellan, you can find, view and use information, as long as your applications are sup-

Continued on page 35

Video firm cuts back

Downsized CBS Fox Video shifts to PCs, minis

ON SITE

BY PATRICK WAURZNIAK
CW STAFF

NEW YORK — A two-year-long downsizing effort that is planned to save 80% in MIS expenses will send CBS Fox Video's last mainframe into mothballs this summer.

Driven in part by shrinking of the company caused by the 1987 sale of a manufacturing operation, the plan to save more than \$4 million per year centers on the replacement of the IBM host with networked personal computers and a trio of Wang Laboratories, Inc. minicomputers.

CBS Fox Video, a partnership of CBS, Inc. in New York and

20th Century Fox Video in Los Angeles, acquires distribution rights for movie titles sold to video stores.

The firm currently bases most of its financial information on an IBM 4381 mainframe that is supplemented by new three Wang minicomputers and four personal computer local-area networks.

That 4381 — scheduled to be removed in July — already represents two steps down from the company's original host system, a dual processor IBM 3081 mainframe.

CBS Fox Video plans to cease its mainframe dependence by July 1. A Wang VS 7150 system and two VS 5000 models will be linked into a network of five

Trimming down

CBS/Fox's MIS spending and staff levels will be fractions of those in 1986 once a downsizing is completed



SOURCE: CBS/FOX VIDEO

MIS spending MIS staff

	MIS spending	MIS staff
1986	\$5.2 million	58
1987	\$3.3 million	24
1988	\$2.8 million	23
1989*	\$2 million	5
1990*	\$0.8 million	5

*Projections for year's end

CW CHART: FRANK C. O'CONNELL

LANs at its New York headquarters and its offices in Chicago and Livonia, Mich.

The strategy is partly a result of the July 1987 sale of its video duplication business to Technicolor, which used about 40% of the computer resources. Eliminating the production-related systems enabled CBS Video to incorporate new business appli-

cations that would have been incompatible with those production systems.

"Initially, we had all sorts of concerns," said William G. Barker Jr., CBS Fox Video senior vice-president of finance and administration and chief financial officer. "The concern on the part of management was we are

Continued on page 34

Fishing for the right, ummm, idea

BY DOUGLAS BARNEY
CW STAFF

Although it takes up 14M bytes of precious hard-disk space, early users of Ideafisher think it is worth every sector.

Ideafisher from Fisher Idea Systems, Inc. is an all new category of software designed for brainstorming. Meant to mimic human memory, Ideafisher is built around a database of more than 60,000 words that can be cross-referenced to over 675,000 directly associated words, phrases, ideas and con-

cepts — and even more secondary or linked associations.

For example, the program lists 625 words and phrases associated with the word "red."

Ideas, however, do not come cheap with Ideafisher. The package sells for \$1,795.

Here is how Ideafisher works: Someone writing a speech about dogs, for instance, could query the term "dog."

Not only would the package create a list of synonyms, it would also kick out cliches and phrases such as hair of the dog, dog bite, dog day afternoon and so on. By

exploring these related phrases, the speech writer could sprinkle the talk with dog puns and historical dog references.

The package leads users through the questioning process with the Qbank module. This component helps users clarify questions and branch into new lines of thought.

For botanist Kim Bridges, Ideafisher is now a constant companion. Bridges, a professor at the University of Hawaii, originally ran the program on a Toshiba 1200 but now must upgrade to a faster Toshiba 3200 just for Ideafisher. The night before the debut of some music he

had written, Bridges racked his brain for song titles. Ideas were not coming easily, so he turned to his Ideafisher.

Bridges wanted the names to have something in common and be based loosely on the concept of travel, exploration or wandering. Within a half hour, Bridges had the names he wanted.

According to Bridges, Ideafisher

Continued on page 34

Inside

- Laptops in the food lane. Page 33.
- The Macintosh works to catch up with CAD. Page 33.
- Dell Computer enters 386SX market. Page 36.

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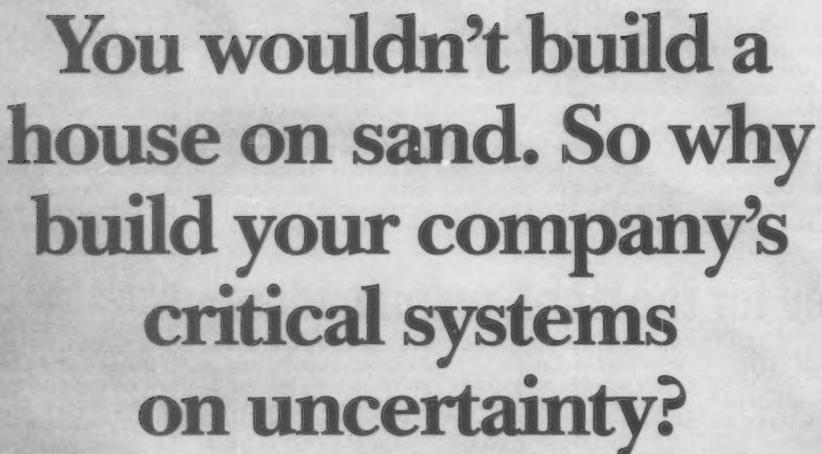
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- Mixed Subscripts and Indexes
- INITIALIZE and EVALUATE
- NOT AT END, NOT ON SIZE, and NOT INVALID KEY
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SMALL TALK

Michael Alexander

Rentals mean business in software



On my way home tonight, I think I'll stop by my local video store and rent a Nintendo video game. It costs a couple of bucks a day to rent, which is a small price to pay if you consider that a single game costs \$35 or more. If I like the game well enough, perhaps I'll buy it for the family's collection.

I'd better hurry, though. Several computer software industry trade groups and firms are lobbying Congress to pass bills that could bar rentals of computer software of any kind.

A couple of weeks ago, in a hearing before the Senate Judiciary Committee Subcommittee on Patents, Copyrights and Trademarks, Heidi Roizen pressed the Software Publishers Association's (SPA) case.

Roizen, who is president of the SPA, said, "Congress must allow software companies to control the commercial rental and exploitation of their products. Software rental businesses undermine the fundamental stability of any software program and the companies that produce it."

I can understand the SPA wanting to protect itself from exploitation. Computer software piracy is costing the industry hundreds of millions of dollars per year, according to various software trade groups.

Under no circumstances would I condone illegal copying of software. But I have to ask, who is going to protect end users from exploitation by software firms?

Continued on page 35

Apple gains in CAD credibility

Software offerings position Mac to compete with MS-DOS, Unix systems

ANALYSIS

BY JULIE PITTA
CW STAFF

Apple Computer, Inc. is still playing catch-up with MS-DOS- and Unix-based systems in the engineering workstation market. But the recent availability of computer-aided design (CAD) software is allowing the Mac to compete more effectively.

Some argue that a lack of software has impeded the Mac in the CAD arena. Yet others say the Mac — which lacks a multitasking operating system — has not offered a good platform for CAD software developers.

"The market for the Mac as a real engineering workstation that would drive the sales of CAD packages is still emerging," said Bill Higgs, an industry analyst at Infocorp.

The venerable MacDraw is probably the best-selling design package for the Mac, Higgs said. However, even the new MacDraw II is not considered a serious CAD package, he noted.

Two established competitors in the MS-DOS software arena recently ported their CAD applications to the Mac. Versacad Corp., in Huntington Beach, Calif., and Autodesk, Inc., in San Leandro, Calif., recently shipped Mac versions. Industry watchers said the commitment of those software developers is a boost for Apple.

For designers

Autodesk's AutoCAD for the Macintosh, priced at about \$3,000, is considered the most fully featured of the available CAD packages for the Mac. It is the only package to offer full three-dimensional capabilities required

for intensive design work. Versacad/Macintosh Edition is essentially a two-dimensional package with 3-D capabilities. It is priced at \$1,995.

The prices of those packages — compounded by the relatively high price of the Mac — appears to have dissuaded some users.

"It's going to take a while for us to move CAD applications from the PCs to the Mac," said Russ Yonda, a Mac support specialist at Hughes Aircraft Co. in Carlsbad, Calif. "Management would have to scrap the PCs, which are working fine, and buy \$12,000 worth of Mac gear. For that price, what are you really getting extra?"

Apple spin-off Claris Corp. in Santa Clara, Calif., began shipping a CAD package last January. Called "the CAD package for everyone else" by industry puns, Clariscad is less expensive

at \$995 than AutoCAD and Versacad. The 2-D package lacks the "bells and whistles" of the other two products, Higgs said. "It's probably not going to be used for serious mechanical engineering or architectural drawing," he said.

The appeal of Clariscad lies in its use of the Mac's graphical user interface. It is likely the easiest to use of the Mac CAD packages, users said.

At least one other software developer said a market exists for a low-end CAD package for the Mac. Integrated Data Design, a Concord, Calif., start-up, has introduced Dreams, a \$500 package similar to Clariscad.

Mike Bailey, a systems integrator at Lockheed Missiles & Space in Sunnyvale, Calif., said there are few at Lockheed using commercially available CAD packages for the Mac.

Lockheed has developed its own CAD package for MG-DOS and is porting it to Unix. "There are some good packages out there, but ours is the best in the market," Bailey said.

Voice challenges icon as computer interface

BY WILLIAM BRANDEL
CW STAFF

REDMOND, Wash. — MIS may soon be able to make personal computing simpler than it is with icon-based personal computers, as voice-activated systems make their way into the commercial fold.

Advanced Products & Technologies (APT), located here, will soon market its Explorer, a handheld computer whose input and output commands are activated by human speech, not by a keyboard. The machine is based on an optimized microprocessor that is able to decipher voice-activated commands.

Although the systems — which are expected to be launched in Japan and Europe in June — will initially only run English- and Spanish-language translation applications using a



Explorer's commands are voice-driven

plug-in software cartridge, MIS sites are the next frontier, said Jack Russell, APT's marketing manager.

APT is targeting executives as potential customers for the machine because, Russell said, their time is too valuable to be spent learning or performing data processing on a PC. Instead, executives need to have pre-

selected information to use at their disposal.

Russell said by using the artificial intelligence-based Explorer with instantaneous verbal commands, company executives can bypass icon-manipulated interface systems, which are widely believed to be the least time-consuming form of personal computing.

"If the executive is leaving for New York City for a day, he can simply download all his New York accounts and his New York-area Rolodex by verbal command," Russell said.

The command is then sent to the personal computer via an RS-232 port to activate a PC-resident application called Voice-Drive, he said.

Future options

Russell said a business scheduling application intended to run on Explorer will be released this year in addition to a porting offering that allows the handheld device to pull information off a base PC.

Traditional PC applications such as spreadsheets and Ash-

ton-Tate Corp.'s Dbase will be available in cartridge form in the near future, he said.

The machine's U.S. debut hinges on a Federal Communications Commission Class B Registration ruling, which will decide whether the machine can be used in homes, Russell said. The machine's speaker microphone, which takes in and expels the audio data, is considered an antenna by the FCC, Russell said.

However, Russell downplayed the FCC-imposed hiatus, promising the systems will be on U.S. retailer shelves by the end of July.

The voice-activated system measures 8 1/4 by 7 by 2 1/4 in. and weighs three pounds. It includes its own built-in, removable, rechargeable battery and recharger, which can power the system up to 2 1/2 hours.

Explorer can access up to 4M bytes of memory, has an RS-232 port and operates at 8 MHz.

The machine is priced at \$2,300, which includes a foreign-language cartridge. The business scheduling cartridge will carry a \$500 price tag.

Portables reap profits for food industry

BY MICHAEL ALEXANDER
CW STAFF

DAYTONA BEACH, Fla. — A growing number of food distribution companies are using laptop computers and a software package called SPS Link to give new meaning to fast food.

Laptop computers are rapidly replacing conventional, handheld data entry terminals because the portable devices cannot be used to retrieve

information about the availability of items on order and pricing, according to Larry Frank, president of Sales Partner Systems and developer of SPS Link.

The software package, originally developed to run on Gridlite Plus portable computers manufactured by Grid Systems Corp., was designed to allow food sales representatives to track inventories, maintain a pricing catalog, enter orders, generate purchase orders and

make other calculations.

"The business of distributing food products to restaurants, hospitals and nursing homes is highly competitive," said Frank, who developed SPS Link. "Profit margins are low. To expand or just maintain profitability, it's essential to keep operating costs as low as possible."

Of added importance, a food service distributor can increase sales because the company's representatives are able to con-

firm inventory and product availability on the spot, according to Frank.

"Sales reps make about 15 calls a day," Frank continued. "Previously, at the end of their shifts, they hooked the handheld terminals to telephones with acoustic couplers and transmitted the data to a host computer. But with 10 to 100 line items — ranging from meats to paper products — for each customer, there was no guarantee that what had been ordered was in inventory."

Armed with their organization's software package and a Grid laptop, sales representatives can be aware of what products are available and offer appropriate substitutes when needed as well as log orders and allocate inventory throughout the business day.

City Provisioners, a food service distributorship here, was among the first companies to purchase the SPS Link and Gridlite portable system.

The company said it has been able to increase its business 25% in the past year using the combination.

CBS Fox Video

CONTINUED FROM PAGE 31

trying something that is leading edge. What if it doesn't work?"

As the video industry and the firm grew, the company's owners, CBS and 20th Century Fox, "decided they didn't want to be in the manufacturing business with a lot of bricks and mortar. What our business was becoming was a company that acquired movie rights and sold those rights. That kind of business lent itself nicely to this new thing called PC LANs," Barker said.

CBS Fox Video is tying the minis to approximately 150 PCs from Compaq Computer Corp. and IBM that are connected on Token-Ring networks running Novell, Inc.'s Netware. The networks are linked via Wang's Universal Network Controller. The video firm uses the Paradox relational database management system from Borland International as an applications development system.

Howard Tatem, CBS Fox Video's vice-president of MIS, said he pushed for downsizing not only to cut costs but also to create an easier-to-use applications development environment. "The user-acceptance level has been considerably better in a PC LAN environment than on a host-based system," Tatem said.



CBS Fox's Barker

Ironically, Tatem is planning on leaving CBS Fox Video on completion of the migration plan he proposed. Tatem, a large-systems MIS professional who previously was director of information processing at Levi Strauss & Co., said he will likely be looking for another position in large-systems management after fulfilling his obligation to CBS Fox Video.

CBS Fox's main applications on the LANs include program acquisition; rights tracking and contract administration, each on the New York headquarters' LAN; corporate finance, including royalty accounting and financial consolidations; domestic marketing, such as promotional materials and advertising; and master tracking, which catalogs CBS Fox Video's inventory of equipment.

Since 1986, information systems employment shrank more than 50% from approximately 60 people to the current 24 employees. By the end of summer, the department will consist of about 10 employees after others have left either through attrition or layoffs.

While Barker admitted "we were reasonably disorganized," the company also saw a golden opportunity to fundamentally change the way it did business, automating many processes.

"All of this just smacks of obvious opportunity and productivity improvement," Barker added.

Fishing

CONTINUED FROM PAGE 31

fisher augments creativity but "doesn't do it for you." It is not artificial creativity.

Ben Edlund, superintendent of Moses Lake school district in Washington, has shown IdeaFisher to 55 people as part of a project for using IdeaFisher as a teaching tool. Some teachers even believe that with a bit of modification, the system can be used in the first grade. The school district has approximately 5,000 students.

Edlund himself has been using the product to help teachers identify problems, work out solutions and provide goal-setting. "I don't think I could stop it with a locomotive," Edlund said of the moment.

tum IdeaFisher has within his school district. Edlund has one word of caution for the program that some people called addictive: "You will start losing time. It sucks you in just like a vacuum."

Paul McCarthy, a free-lance writer based in Hawaii, uses IdeaFisher to come up with metaphors. He also uses the program to come up with the all-important first paragraph. McCarthy, who uses an older Intel Corp. 8088-based machine, is considering moving up to a 80386 to get searches done more quickly.

The company was founded by Marsh Fisher, who also co-founded Century 21 Real Estate. Fisher Idea Systems spent some \$3.5 million developing the product and is currently working on a version for Apple Computer, Inc.'s Macintosh.

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COMPUTERWORLD

MAY 15, 1989

Barney

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ported. Of course, Magellan supports key Lotus applications and most old-style, so-called text-mode applications.

What it cannot fully support are files created with a Microsoft Windows application, which are becoming increasingly popular.

Search and rescue

Basically, Magellan lets you think of the topic or a word that you are interested in. It then searches your entire hard disk for the file that contains that word. You can also launch directly into that application. You don't even have to spell right, but it sure helps.

Here's an example of how it could work. Let's say I work for you, but I've been sloughing off lately. You want to fire me, and you need to give a complete report to your boss.

You know that others have sent you memos concerning my work, which you locate using the key word "shoddy." Then, you want to know how much money you'll save when I'm gone, so you search for a spreadsheet with a column labeled "minimum wage."

Finally, you can cut and paste all this information into one file that you submit to your boss. Just make sure your data-

base is Ashton-Tate's Dbase and your text files are stored as ASCII or were created using Manuscript or one of the top five word processors.

It's also a great product if you've been away from the office for a while and have forgotten what file you need to work on. All you need to do is remember the topic or a key word, and away you go.

Forked tongue

Despite its amazing usefulness, Lotus will have a tough time making this a product for the 1990s. To view the files easily, Magellan must understand the file format. Here, Lotus is speaking with a forked tongue.

On one hand, it appears to be protecting its file format in 1-2-3 Release 3.0 by not publishing it. On the other, it wants competitors to support Magellan openly. Like most big companies, Lotus wants to have its cake and everyone else's too. Well, it can't, and it will be Magellan users who get the indigestion.

What Magellan really needs is an industrywide group that ensures that all publications are accessible via Magellan. If that ever occurs, and Lotus smooths some of the awkwardness in an otherwise superbly crafted interface, we'll all use the product eventually.

Barney is a *Computerworld* senior editor, PCs & workstations.

Alexander

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There are just too many vendors in this business that think even the most ordinary spreadsheet or word processor is worth \$400 or higher. Rentals give end users a chance to try a program without having to part with a walletful of money. If a program is worth its asking price, then end users will buy it. Maybe that is what worries some software firms most: Their products will not withstand close scrutiny by end users.

The software firms oppose rentals because they claim that the sole purpose of them is to enable buyers to copy software. I disagree. If other software — videotapes and records, for example — is an indicator, then rentals and even copying of programs for legitimate, noncommercial purposes can contribute to the industry's overall well-being.

Look what rentals have done for the home video business. In the early 1970s, Hollywood went to court to stop consumers from using videocassette recorders to copy programs off the air. Today, home videos generate more revenue than box office sales, and Hollywood would not think of cutting a motion picture deal without factoring in profits from the sale of tapes for rental use.

Studies by the Motion Picture Association of America suggest that avid home video watchers are more apt to go to the movie theater. Movie theater attendance collapsed in the early 1970s before the

advent of the VCR but has risen steadily since then in sync with VCR sales.

Record companies have been moaning for years about consumers copying albums and, more recently, compact discs. The Recording Industry Association of America claims that the industry loses \$1.5 billion per year to home taping, although no one seems to know for sure how the figure was calculated. People who engage in this sort of legitimate activity are far and away the largest group of CD and tape buyers. Meanwhile, the record industry is racking up unparalleled profits, thanks to high-priced CDs.

The proposed law may face its toughest opposition from lending libraries because it would prohibit libraries from loaning computer software, although not audio and video recordings. If Congress takes away the right to borrow software, can videos, compact discs and even books be far behind? Imagine where we would be if book publishers had been successful in banning libraries from lending books.

The proposed legislation may not prohibit rentals of Nintendo video games, by the way. The SPA said last week that the cartridges are difficult to copy and are inexpensive compared with business software. If I was a computer software firm, I'd worry more about Nintendo getting into my business. It says it expects to knock down \$2.6 billion in sales this year.

Alexander is a *Computerworld* senior editor, PCs & workstations.

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NEW PRODUCTS

Systems

Dell Computer Corp. has entered the Intel Corp. 80386SX-based personal computer marketplace with the announcement of the 16-MHz Dell System 316.

The product reportedly offers flexible entry into 32-bit applications, and the base system configuration includes a 29 msec, 40M-byte hard drive, 1M byte of random-access memory and a monochrome graphics video display.

The Dell System 316 is priced at \$2,949. The same configuration with 2M bytes of RAM costs \$3,149. Toll-free technical support and a one-year warranty on parts and workmanship is included, the vendor said.

Dell Computer
9505 Arboretum Blvd.
Austin, Texas 78759
512-338-4400

Toshiba America Information Systems, Inc. announced a 100M-byte hard disk drive version of its Intel Corp. 80386-based T5100 portable personal computer.

The higher storage capacity drive system provides a 25 msec average access time and will be available in June for \$9,199, the vendor said.

The original T1500, equipped with a 40M-byte hard drive and 29 msec access time, will continue to be priced at \$7,199.

Toshiba America
9740 Irvine Blvd.
Irvine, Calif. 92718
714-583-3000

A turnkey optical disk system for document storage and retrieval has been introduced by Packard Bell Electronics, Inc.

The Optifile single-user system reportedly consists of a Packard Bell 286 or 386 central processor; main memory of either 6.5M or 10.5M bytes; disk storage of 80M or 140/210M bytes; and a 60M- or 150M-byte tape drive. A flatbed scanner, display monitor and laser printer are also provided.

According to the company, the system can accommodate either 5½-in. optical disks with an 800M-byte capacity per disk or 12-in. disks with a capacity of 2G bytes each.

Pricing starts at \$39,850.

Packard Bell
9425 Canoga Ave.
Chatsworth, Calif. 91311
818-773-4400

A Motorola, Inc. 88000-based single-user turnkey Unix-based workstation has been announced by Opus Systems.

The 17 million instructions per second Personal Mainframe/88SDS is targeted at Motorola 88000 software developers and reportedly offers a variety of development tools, including C and Fortran compilers.

Features include 4M bytes of on-board memory, Ethernet networking capabilities and complete AT&T Unix System V Release 3.1, the vendor said. The unit is priced at \$11,200.

Opus Systems
Building 400
20863 Stevens Creek
Cupertino, Calif. 95014
408-446-2110



Opus Systems' Unix-based workstation offers many tools

A 17 million instructions per second general-purpose Unix workstation based on Motorola, Inc.'s 88000 reduced instruction set computing architecture has been announced by Everex Systems, Inc.

The 20-MHz Step 8820 incorporates a dual-processor design and will run a Unix System V software developed for Motorola's 88000, the vendor said.

The workstation allows the simultaneous execution of both Unix and MS-DOS tasks and is available in memory configurations ranging from 4M to 20M bytes.

Pricing for the workstation starts at \$12,995.

Everex Systems
48431 Milmont Drive
Fremont, Calif. 94538
415-498-1111

Application packages

Fox Software, Inc. has reportedly upgraded its database management software package.

Foxbase Plus/Mac 2.00 now includes a report writer that allows users to create reports in both columnar or free-form styles by drawing the desired report layout, the vendor said.

Other functions include on-screen previews and automatic label generators. The software program was designed for Apple Computer, Inc. Macintosh computers.

Single-user versions are priced at \$495.

Fox Software
118 W. South Boundary
Perryburg, Ohio 43551
419-874-8678

A graphics software tool kit designed to create three-dimensional sculpted images has been announced by Abbott, Foster and Hauserman Co.

The 3-D Drawing Board runs on IBM Personal Computers and compatible systems and requires 512K-byte random-access memory as well as IBM's Enhanced Graphics Adapter. According to the vendor, users can create, edit and display solid objects as well as calculate shading and surface penetrations.

The program costs \$89.

Abbott, Foster and Hauserman
Fifth Floor
44 Montgomery St.
San Francisco, Calif. 94104
800-562-0025

Marc Software International, Inc. has introduced a version of its Wordmarc word processing package for Digital Equipment Corp.'s Decstation.

The software program is especially suited for desktop publishing and word processing applications and runs in both VAX/VMS and MS-DOS operating environments, the company said. Graphics capabilities are included, and font size ranges from 1 to 999. The Wordmarc for the Decstation is priced at \$895.

Marc Software International
260 Sheridan Ave.
Palo Alto, Calif. 94306
415-326-1971

Precision, Inc. has unveiled a file management program for Microsoft Corp.'s Windows environment.

Superbase 2 Windows reportedly includes 999 index sequences and a runtime version of Microsoft Windows Version 2.03. The software package incorporates a text editor, mail/merge, label printing and telecommunications capabilities, the vendor said. Data can be imported and exported in Microsoft's Excel and Lotus Development Corp.'s 1-2-3 spreadsheets as well as from Ashton-Tate Corp.'s Dbase II and III database management programs.

Superbase 2 Windows costs \$295 and is scheduled to ship in the second quarter.

Precision
Suite A
8404 Sterling St.
Irving, Texas 75063
214-929-4888

Utilities

A booting utility designed for users with both the MS-DOS and OS/2 operating environments is now available from Bolt Systems, Inc.

Multiboot installs and retains both operating systems on the hard disk to eliminate the need for floppy boots, the vendor said. The product is available in both 3½- and 5¼-in. disk formats and is priced at \$49.95. A manual and technical assistance are provided.

Bolt Systems
4340 East-West Highway
Bethesda, Md. 20814
301-656-7133

A menu program developed for use with laptop computers has been introduced by Continental Resources, Inc.

Lapmenu is a graphics-based software program that utilizes large, easy-to-read type and stylized icons. All DOS utilities included with the program are fully automated, according to the company. Functions include a built-in calendar, calculator and memo pad.

Scheduled for release in June, the package will carry a price tag of \$89.95, and volume discounts will be offered.

Continental Resources
175 Middlesex Turnpike
Bedford, Mass. 01730
617-275-0850

A software package designed for CNC file management is available from CNC Filer.

The product, also called CNC Filer, allows users to edit, receive, send, save, sort, print and organize CNC programs, according to the vendor.

The program requires an IBM Personal Computer XT, AT or compatible, and a free demonstration disk is available.

CNC Filer is priced at \$499.

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CNC Filer
P.O. Box 1258
120 Davis St.
E. Douglas, Mass. 01516
508-476-3109

Development tools

Metrabyte Corp. has announced VOS/DVOS, its Vision Operating System for the company's line of Vision products for the IBM Personal Computer XT, AT and compatible computers.

The product provides users with an inexpensive alternative to custom-made or minicomputer-based imaging systems. The operating system reportedly features an icon interface, multiwindow environment and on-line Help screen facilities. No programming is required, the company said.

The VOS Vision Operating System is priced at \$99. The DVOS Vision Operating System and software libraries cost \$499.

Metrabyte
440 Myles Standish Blvd.
Taunton, Mass. 02780
508-880-3000

A computer-aided design and drafting software package has been announced by Ditek International.

The Dynacadd program is reported to be a two- and three-dimensional product that features a programming language, compiler, linker and object analyzer. Scheduled for release this month, the product will be available in versions for both Apple Computer, Inc. and IBM personal computers, according to the vendor.

Dynacadd costs \$1,995.

Ditek International
Unit 3
2651 John St.
Markham, Ont., Canada L3R 2W5
416-479-1990

A software development package for machine vision applications has been announced by Imaging Technology, Inc.

Called Itex-Align, the software requires an IBM Personal Computer AT or compatible; PCvision Plus, a proprietary single-board frame grabber; and the Itex PCplus subroutine software library. The package reportedly provides all functions necessary for automated object registration in applications and includes auto-learn capabilities. Itex-Align quantity pricing is set at \$2,250 per license.

Imaging Technology
600 W. Cummings Park
Woburn, Ma. 01801
617-938-8444

Macintosh products

An internal, 2,400 bit/sec. modem for Apple Computer, Inc.'s Macintosh II machines has been introduced by Prometheus Products, Inc.

The Promodem 2400II Plus reportedly includes MNP Level 5 protocol and can be purchased with an additional RS-422 serial port, the company said.

The unit operates at 2,400, 1,200 and 300 bit/sec. and is priced at \$399.

Prometheus Products
7225 S.W. Bonita Road
Tigard, Ore. 97223
503-624-0571

Microtech International, Inc. has announced an unlimited capacity, removable hard disk for Apple Computer, Inc.'s Mac-

intosh computers.

The Microtech R45 can store up to 42.7M bytes of formatted data on one removable cartridge and provides a 25 msec average access time. It operates in Macintosh SE, Macintosh Plus and Macintosh II machines and is priced at \$1,099.

Microtech International
29 Business Park Drive
Brantford, Conn. 06405
203-488-7744

Integraph Corp. has announced a version of its Microstation computer-aided design and manufacturing software package for the Apple Computer, Inc. Macintosh platform.

Dubbed Microstation Mac, the product reportedly includes graphics database

compatibility with other Microstation versions and incorporates a full implementation of the Macintosh user interface.

The package is scheduled for release in July and will be priced at \$3,300, the company said.

Integraph
1 Madison Industrial Park
Huntsville, Ala. 35807
205-772-2000

Data storage

A 20M-byte tape backup system for Epson America, Inc. and Toshiba America, Inc. products is now available from Nth Group Peripheral Software.

Designated the Nthlptape, the device

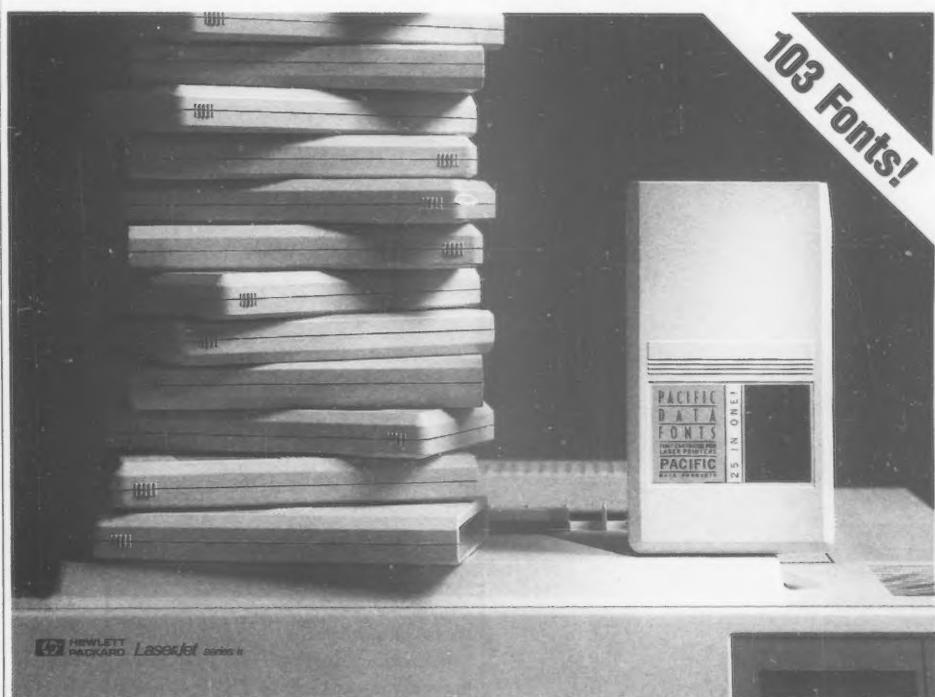
contains a menu-driven software program and provides file-by-file operation along with tape utilities. It costs \$999.

Nth Group Peripherals Software
3190 Main St.
Morro Bay, Calif. 93442
805-772-6121

Mitsubishi Electronics America, Inc. has introduced a 3½-in. rigid disk drive for performance desktop and laptop computers.

The MR335 has 54.1M bytes of unformatted storage and an average access time of 20 msec. It costs \$615.

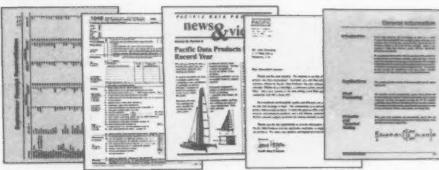
Mitsubishi Electronics
991 Knox St.
Torrance, Calif. 90502
213-515-3993



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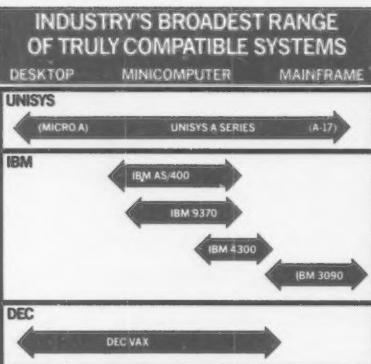
Equally significant are the results of a recent DATAPRO user survey, in which the Unisys high-end A Series beat IBM in six key categories.

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1988 DATAPRO USER SURVEY¹

A12/A15/A17 Took Top Honors Over IBM ¹ in:		
Overall satisfaction	8.8	vs. 8.3
Performance as expected	100%	vs. 96%
Recommendation to others	100%	vs. 96%
Ease of operation	9.5	vs. 7.5
Reliability	9.6	vs. 9.3
Operating system	9.6	vs. 8.8

¹For IBM 3090 performance ranges surveyed. Results reported represent average IBM score for each category.

²Two systems and other savings.
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UNISYS

NETWORKING

DATA STREAM

Patricia Keefe

Novell's color of the day



Trying to keep Novell's chameleon-like strategies straight is like kicking around a ball of confusion. Just when you think you've got a good shot at it, it moves. So you've really got to pay attention, especially now that Novell has unwrapped "Netware for the '90s," with delivery dates stretching over the next 18 months.

It's not so much that Novell changes its stripes — don't worry, it still wants to promulgate networks for the good of all LAN-kind. It's just that the network software vendor does a good job of recoloring them every once in a while, sometimes to the point of blacking out what was once there.

For example, who remembers Systems Fault Tolerance Network Level III? Many of us do, but Novell would prefer that we didn't. It doesn't even mention this product anymore. So if you're waiting for it, don't.

Then there are the value-added processes, or VAPs, which allow an application to function inside a file server simultaneously with the network operating system. At one point, Novell was very big on VAPs as a tool for applications developers, but these days we don't hear much about them, and it is unclear just how many developers ever took advantage of them.

Other times, it just seems that Novell can't make up its mind. Take hardware. First it's in, then it's important enough to buy microcomputer-maker Santa Clara Systems (SCS), then it's out — along with SCS. Now Novell is trying to snap up Excelan, which gets 50% of its revenue from hardware, and has stated that only commodity hardware is out. Last week, amid

Continued on page 50

Inside

- Retix pushes OSI Unix port out in time for GOSIP bids. Page 42.
- Packet switchers swamp market with announcements. Page 48.

Vines, DEC mail to be pen pals

BY PATRICIA KEEFE
CW STAFF

COLUMBUS, Ohio — Patience is a virtue, as some users of Banyan Systems, Inc.'s network software can well attest. But in just a few weeks, managers anxious to integrate Digital Equipment Corp. VAX hosts into their networks may be able to achieve that goal without traumatizing users or racking up costly electronic postage bills.

Next month, a systems integrator here plans to start shipping the first phase of a Banyan Vines-to-DEC mail gateway.

And that would be welcome news to some managers.

"We are interested in accomplishing a free-flowing exchange between our PC network and our host, and in some sense that means an interface to VAX mail," said Robert Huffenberger, manager of system support at Battelle Memorial Institute.

Opting for Ethernet

Dynamics Research Corp. in Andover, Mass., currently solves its mail problem by opting for VAX terminal emulation over Ethernet.

"Our problem is to get mail back and forth without [PC users] having to leave whatever they are doing to sign onto the VAX, which means they have to start up user accounts on the VAX, creating billable time," said Jeff Hastings, the firm's telecommunications manager.

Bill Newkirk, a technical writer at Rockwell Corp. in Melbourne, Fla., said his concerns center around limiting the amount of hardware required at each desk, as well as minimizing the need to learn extraneous, nonnative commands.

With these issues in mind,

Ilan, Inc. has developed Transport/VAX using Banyan's recently announced tool kit.

The software reportedly provides a transparent mail gateway between Virtual Networking Software (Vines) and DEC's Vaxmail and All-In-1 mail systems. Currently in beta testing, the gateway is slated for June delivery.

The gateway is said to be the first direct link between Vines and DEC mail systems. Xionics Ltd. of London offers an X.400 gateway with a user interface fully integrated with Banyan's Streettalk. Soft-Switch, Inc. in Wayne, Pa., has a mail gateway, but it requires that an IBM host be situated between a Vines

Continued on page 50

Study: Net industry's sunny day clouds over

BY ELISABETH HORWITT
CW STAFF

NEW YORK — It's slump time for the data communications industry. After enjoying explosive and then respectable growth, vendors are now facing a make-or-break period characterized by slowing sales, intense competition and fundamentally different user needs, according to a recent study by Booz, Allen & Hamilton, Inc.

The stretch between 1983 and 1985 — just prior to and just after divestiture — was the networking industry's heyday, with growth of 120% or more per year for most segments, the New York-based consulting and accounting firm said. This growth reflected the fact that a number of segments, including local-area networks, network control systems and private T1 networks, were really coming into their own.

During the period just ended,

from 1986 to 1988, growth has been modest but still strong, ranging from 59% per year for LAN sales to 0.5% for modems, Booz Allen said. The biggest dip has been in network control, from 150%-plus annual growth until 1985 to only 13% growth from 1986 through 1988.

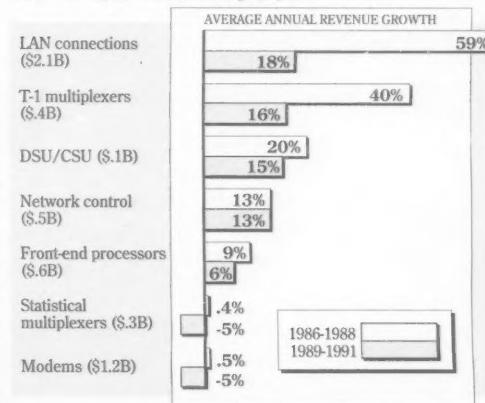
For the next three years, however, basic networking equipment market growth is due to take a dive in all areas except network control, the consulting firm predicted, using figures from Stamford, Conn.-based Gartner Group, Inc. and San Jose, Calif.-based Dataquest, Inc.

To survive, Booz Allen said, vendors must address users' increasingly diverse and sophisticated needs in the following areas:

- Interoperability.
- Reliability in network operations.
- Cost-effectiveness.
- Flexibility that allows systems

General decline

Only network control products show stability as growth rates are expected to slip for data networking equipment



SOURCE: BOOZ ALLEN & HAMILTON, INC., DATAGURST, INC. AND GARTNER GROUP, INC.

CW CHART: DOREEN DAMELE

to adapt to changing customer needs.

Vendors have been slow to adjust their product strategies to meet these demands, which is a major reason for today's sluggish market, Booz Allen said. While computer and data communications vendors, carriers and sys-

tems integrators have converged on the wide-area networking market, most have focused on addressing as broad a range of customer networking needs as possible rather than on concentrating on integrating and managing their various products, Booz Allen said.

PBX vendors embrace Basic Rate

BY ELISABETH HORWITT
CW STAFF

DALLAS — Three leading private branch exchange (PBX) vendors recently announced support for the Integrated Services Digital Network (ISDN) Basic Rate Interface, opening up their PBXs to voice/data terminal vendors that comply with the standard.

The announcements, made at the recent ISDN-laden International Communications Association

'89 (ICA) conference, should be particularly welcome to firms that want to extend the PBX's ISDN functionality to a wide variety of user devices.

Several vendors have announced support for the Primary Rate Interface, used primarily to connect customers' and carriers' ISDN switches. But with the exception of AT&T, leading players have dragged their feet when it comes to supporting Basic Rate, which provides two 64K bit/sec. digital channels, plus a

separate 16K bit/sec. channel for user devices to link to an on-premises PBX or a carrier's Centrex service.

The ICA introductions included the following:

- Northern Telecom, Inc. announced immediate availability of Basic Rate access capability for its Meridian SL-100 systems.
- Ericsson, Inc. announced an ISDN migration strategy that calls for the LM Ericsson subsidiary to release products com-

mercially to support both Primary Rate and Basic Rate Interfaces by the first quarter of 1990.

• Hitachi America, Inc. officially unveiled its HCX-5000 ISDN-compatible switch, which is said to support the Basic Rate Interface and has passed compatibility tests for AT&T's Primary Rate Interface service.

The product family includes two switches, the HCX5400, which supports up to 2,528 ports, and the HCX5500, which accommodates 5,056 ports.

Chicago correspondent Bookers contributed to this report.

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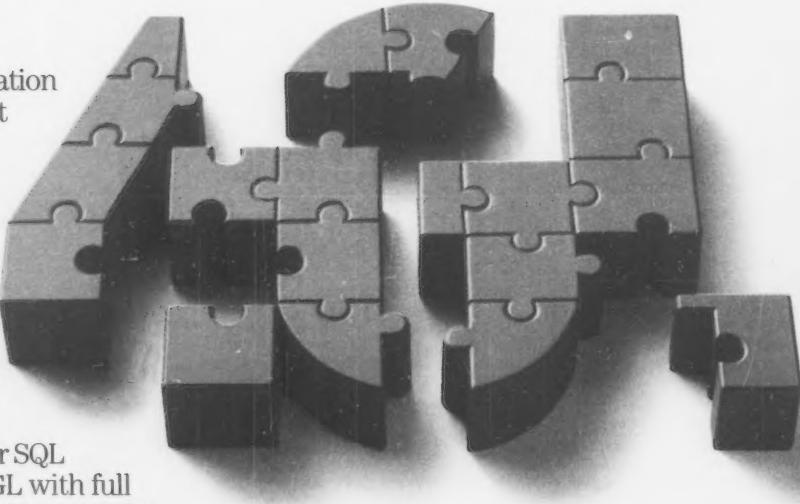
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*1 for good reason.



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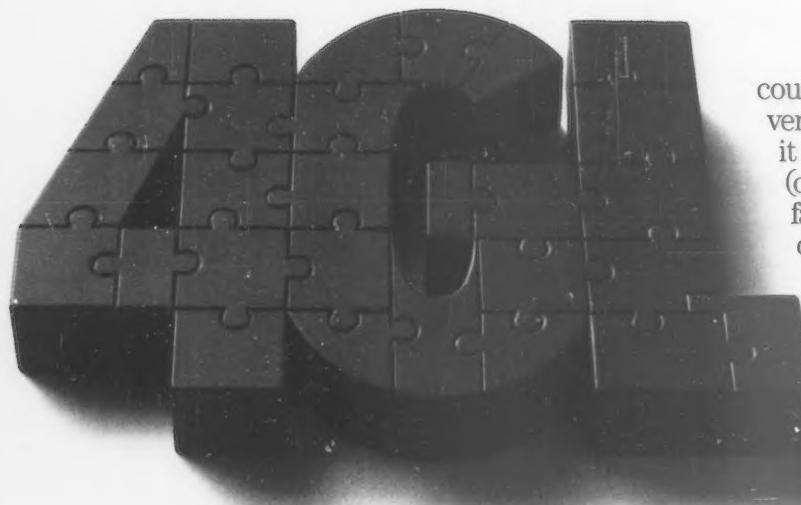
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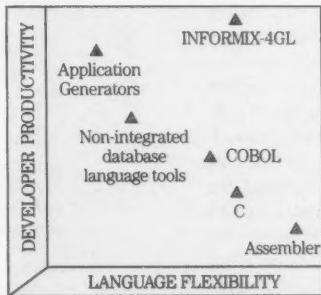
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Retix targets user market, introduces first Unix OSI port

BY PATRICIA KEEFE
CW STAFF

SANTA MONICA, Calif. — Retix, a supplier of Open Systems Interconnect (OSI) software, unwrapped what appears to be the first Unix port of a seven-layer OSI stack last week — just in time for the first wave of bid requests based on the Government OSI Profile (GOSIP) standard.

The event is noteworthy for users because the Retix port, known as OSIX, is

likely to wind up as a key ingredient in GOSIP bids, and many commercial OSI products are already built around Retix's OSI stacks. Users of those products may find that their vendors will add Unix support to existing product lines.

The Unix port also represents Retix's second entry into the end-user market. As OSI becomes less of a theoretical issue and users gain more practical experience with early pilots, Retix has begun a subtle shift away from its previous OEM-only fo-

cus. This is also the first time the developer has offered an OSI product under a specific operating system.

OSIX "represents a shift in strategy [for us] to produce end-user oriented products and to port our OSI stack to a specific operating system," said Jeff Marx, Retix's associate director for product marketing.

Hoping to fuel the rate of OSI implementations, Retix also revealed that it is working with Lachman Associates, a Napererville, Ill.-based supplier of Transmission Control Protocol/Internet Protocol (TCP/IP), to provide a migration path to OSI for users of TCP/IP products.

The OSIX line will include X.400 messaging, FTAM and transport products for local- and wide-area networks. Binary

versions of Retix's OSIX will support both Unix System V Release 3 and Intel Corp. 80386-based systems. Off-the-shelf packages are slated for shipment next month.

"At this stage, corporate users are likely to be testing OSI products such as the LAN transport or FTAM product, but we can ship a complete network if needed," Marx added.

X.500 Distributed Directory Service and Virtual Terminal remote log-in for Unix platforms are slated for shipment in the fourth quarter, as is support for systems based on Motorola, Inc.'s 88000 reduced instruction set computing processors.

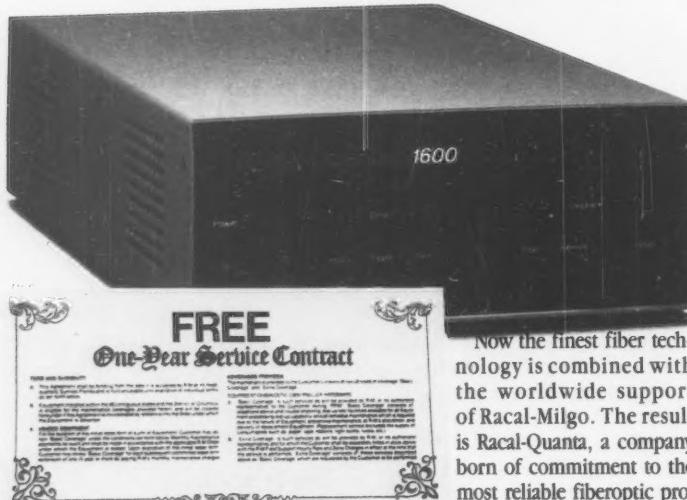
Retix's OSI applications run as processes in Unix environments using the common AT&T Transport Layer Interface to OSIX LAN and WAN connectivity products.

These transport products can also be configured as routers for linking LAN to public or private X.25 subnetworks, according to the vendor. OSIX will support key application programming interfaces for X.400 and FTAM as defined for factory networking.

Pricing starts at \$295 for binary OSI transport products and \$395 for OSI applications software.

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BIT BLAST

TOP group seeking out new members

The Technical and Office Protocol Vendors Group is actively seeking new members, particularly among systems integrators. The group is said to provide vendor viewpoints to the North American MAP/TOP Users Group.

Telephone company security and facilities managers attended a seminar entitled "Terrorism and the Telecommunications Industry" last month, sponsored by ADT Security Systems, Inc.

One motivation for the seminar was a recent report presented by the National Academy of Science to the U.S. Senate, stating that U.S. telecommunications networks are vulnerable to terrorist attacks.

EDI, Inc. is reportedly the first electronic data interchange software vendor to become an approved source for AT&T's EDI Interface. The vendor's software program for translating personal computer-generated documents into EDI formats can now interface with AT&T's EDI and network services via a new module called Te-link, according to EDI.

Concord Communications, Inc. joined the Corporation for Open Systems International, shortly before Concord's Manufacturing Automation Protocol products were certified as Open Systems Interconnect-compliant under COS' new Mark program.

When it
comes to their
information
systems, there
is one thing
all CEO's can
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Your CEO has said it. And you've said it yourself. There has to be a better way.

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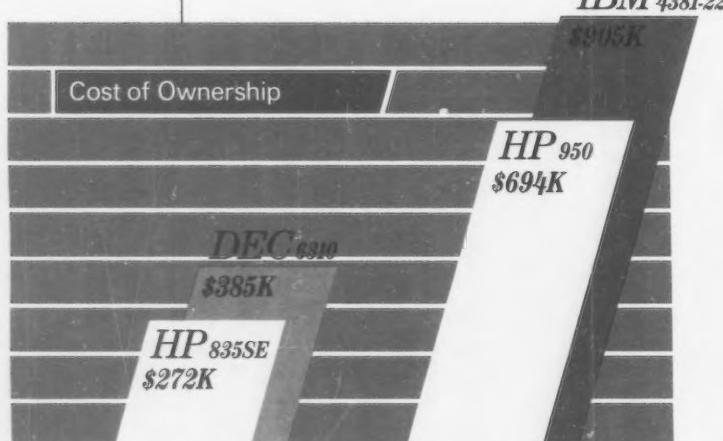
"\$10,000,000 invested in systems and software and I still can't find out what I need to know when I need to know it."

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There is a better way. And Hewlett-Packard can give it to you today in the form of lower computing costs. True multivendor connectivity. An application environment that dramatically increases the usefulness of your system. And unmatched customer service and support.

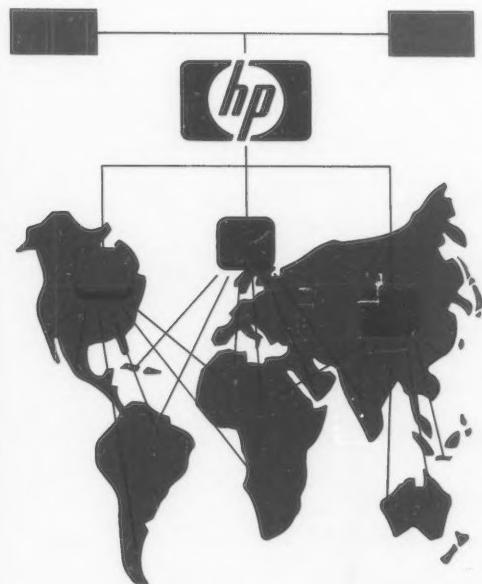
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It's true. The chart at left shows you how investments in HP systems comparable to systems from IBM or DEC can reduce your cost of ownership by up to 29%. And do so while giving you considerable benefits in terms of performance and reliability.



*Note: The cost-of-ownership figures reflect the initial purchase price and 5-year hardware and software support costs for servers configured with operating systems, memory, mass storage, and terminal connections. Prices as of Feb. 15, 1989.

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easy migration. And, because they constitute the broadest family of RISC-based systems in the business, they allow us to meet the computing needs of any organization, large or small.

HP gives you true multivendor networking. Chances are you've already made a multivendor investment. Hewlett-Packard is committed to making the various parts of that investment work as if they were made for one another.

"We either have to get all our computers talking to each other...or pray for a 9-day week."

We achieve that goal through an unwavering dedication to an open networking strategy we call HP AdvanceNet. It's a strategy that operates in strict conformance with industry standards such as OSI. As well as with de facto standards like TCP/IP and SNA.

It's a strategy that we back with over 300 products for both local office and company-wide networking. Products which have been installed in over eighty of the top one hundred *Fortune 500* companies.

Finally, it's a strategy that stands in stark contrast to the proprietary approach often taken by other vendors.

Hewlett-Packard's AdvanceNet offers true multivendor connectivity. It already conforms to standards which offer your company far greater potential for communication and growth into the future. And it includes a service and support program designed expressly for your multivendor environment.

HP lets you fully exploit all the information in your system.

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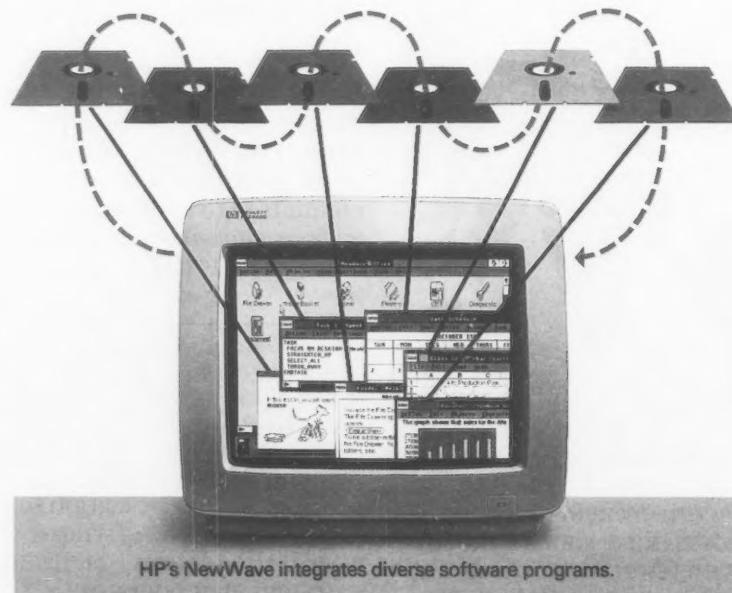
"Three weeks of retraining? Why do we have to reinvent the wheel every time we introduce new software?"

accessing, manipulating, and sharing information. Information housed in mainframes, in minicomputers, in workstations and PC's.

There is a better

It's HP's NewWave environment. With it, the usefulness of applications can be greatly expanded. Users can, for example, create documents

one is immediately reflected in the others. And it automates standard procedures across applications, greatly reducing the amount of time



HP's NewWave integrates diverse software programs.

that incorporate text, graphics, and spreadsheets. Send those documents anywhere in the system. And do all this using their favorite software.

But NewWave goes even further. It allows for an interaction between text, numerical, and graphical data such that a change in

spent performing repetitive tasks.

HP's NewWave environment adheres to standards* and enjoys widespread industry support. It increases user

*HP's NewWave software technology is based upon and extends the capabilities of well-accepted PC and workstation environments: Microsoft® Windows, Presentation Manager, or OSF/Motif.

way.

productivity and decreases time-to-decision. In short, it makes using your computer system far more intuitive and therefore much easier.

HP promises you the best service and support in the industry.

Over the past six years, in the Datapro User Surveys, Hewlett-Packard has achieved the best overall record among industry leaders for customer support satisfaction.

"The problems with our computer systems begin with the companies that make them...they're slow to respond and far too proprietary"

It's a record of which we're very proud. A record based on averages across six key service and support categories. Maintenance effectiveness. Maintenance responsiveness. Troubleshooting. Documentation. Education. And software support. A record that says we work in partnership with each of our customers, and that we care as much about their business as we do about our own.

In the end, it's really very simple. Only by acknowledging your frustrations and finding real-world solutions have we been able to develop networked computer systems that offer you clear competitive advantages. And only

by continuing to work with you will we be able to help you meet the considerable challenges of the future.



We at Hewlett-Packard have structured our entire company around a very simple idea: giving our customers everything they need to compete more effectively.

Today, under that mandate and backed by the widest range of systems, peripherals, PCs, and instruments in the industry, we are delivering the "better way" demanded by American business.



John Young
President & CEO
Hewlett-Packard



**HEWLETT
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Tymnet, Telenet and Hughes swarm on market

BY ELLIS BOOKER
and ELISABETH HORWITT
CW STAFF

Seeking new niches in an increasingly crowded market, three leading packet-switching vendors released a deluge of announcements earlier this month,

including X.25 service geared to smaller sites, enhanced network management systems and strategic alliances with other vendors.

Hoping to lure midsize organizations off existing private systems and to encourage small companies to establish their first

data network, Tymnet recently announced Small-scale Distributed Networks. The offering combines a private packet-switched network that can support up to 16 nodes with links to Tymnet's or another vendor's packet-switching services.

According to Michel Dar-

nau, product line manager at the McDonnell Douglas Network Systems Co. subsidiary, Small-scale Distributed Networks target "companies that need more than an X.25-to-asynchronous protocol conversion but not a dedicated Tymnet-provided private network."

Users can configure, monitor, and control network nodes using IBM-compatible personal computers loaded with Tymnet's Local Engine Monitor network management software. Customers cannot configure the public portion of their X.25 network, however, although Tymnet does offer some monitoring capabilities. A network that grows beyond 16 nodes can be upgraded to a full Tymnet network, Tymnet said.

Tymnet also announced an agreement to link its nationwide packet-switching service with Southwestern Bell Telephone Co.'s regional packet-switching service, Microlink II. The connection is available now in six cities.

Facts on file

Telenet Communications Corp. introduced Network Management Information System (NMIS) for users of private packet-switched network equipment. The system uses a relational database to store data and generate reports about utilization, call-accounting, equipment and line inventory and network events.

The information collected by NMIS is said to facilitate accounting and billing as well as network troubleshooting, design and capacity planning by network managers.

Telenet also announced plans to support CCITT V.32 dial-up modem access to its Public Data Network. This enhancement, scheduled to be available in 50 cities by year's end, will allow users with V.32 modems to access Telenet's packet-switching service at a rate of 9.6K bit/sec.

Bells and whistles

Hughes Network Systems, Inc. announced new network management products for its Integrated Packet Network line, providing support for two leading host vendors' systems.

A link to IBM's Netview/PC is said to allow users to monitor events and alarms on Hughes' packet switches via IBM's host-based network management system, Netview.

The Graphics Network Operator Console is an IBM Personal Computer-based network management workstation that reportedly provides a user interface based on Hewlett-Packard Co.'s OpenView Windows architecture. The graphics-based interface is said to provide coordinated access to a variety of network management functions, including network configuration, event management and network status.

Hughes also announced a broadcast feature that is said to provide point-to-multipoint simultaneous dissemination capability to the Integrated Packet Network family of packet switches.

How Ameritech helped Bradley Center become

a hot ticket.

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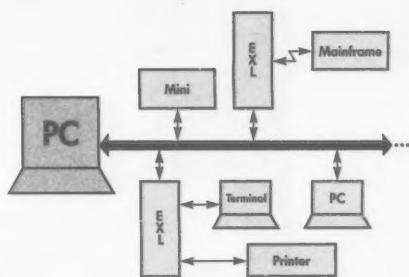
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Vines, DEC

CONTINUED FROM PAGE 39

server and VAX host, both users and Ilan said.

Transpost/VAX is similar to Banyan's previously announced mail gateway for linking Vines to Apple Computer, Inc.'s Appletalk network. In both cases, users reportedly can send and receive electronic mail without having to grapple with unfamiliar syntax or know that the other party is on a different system.

Communication between incompatible systems is an issue at Dynamics Research, where 500 users on dumb terminals perform office automation activities on a VAX and several hundred users do

the same kinds of applications on a PC network. "How do you get different people with different desktop systems to put a proposal together when [the document] has to end up in one place in one format or an Interleaf system?" Hastings asked.

These users could use Ilan's mail gateway to exchange ASCII files by attaching up to 10 files to an E-mail message.

"Once we put in the bridge, we'll be able to send attachments to the technical publications center," said Hastings, who was waiting to receive a beta version of the software last week.

There is no training, Ilan claimed, because the user continues to use the mail system of his choice.

Transpost/VAX also features certification of mail receipt. Notification upon re-

ceipt by the addressee is supported for All-In-1 and Vines mail. Notification of receipt by the mail agent is supported for Vaxmail, Ilan said. "Unlike physical mail or a ringing phone, electronic mail tends to sit in the corner and age," Newkirk said.

The gateway also affords systems administrators the opportunity to customize or exercise a great deal of control. Administrators can allow multiple user IDs, mailing lists, nicknames and specification of preferred mail systems. Systems and feature access are also controllable. Messages can be broadcast across the system, and mail can be encrypted during transit.

Systems requirements for Transpost/VAX include a Banyan server running Vines 3.10, a VAX running VMS 5.0 or

4.7, a serial communications link between the VAX and server and DEC's PMDF or Message Router software.

Transpost/VAX costs \$3,495 and includes Vines server software, a VAX VMS software tape and documentation. Additional server licenses cost \$295. The VMS Mail portion ships next month, but the All-In-1 piece is more rich in features and so will not be ready until later this summer, Ilan said.

Keefe

CONTINUED FROM PAGE 39

the Network 386 razzle dazzle, Novell President Ray Noorda told reporters he wants to get the hardware content of his business down to 10% to 15% of the network, and Excelan will handle the hardware to a great extent.

Then there's the OS/2 shell game. First Novell fiercely derided Microsoft's OS/2 LAN Manager, saying that once this product shipped — more than a year after it was introduced — it would total less than the sum of what Network was at the time LAN Manager was announced. Obviously, no licensing or support plans here. At one point, Novell said it had no plans to support the Named Pipes application programming interface (API).

But LAN Manager has picked up steady support from such key vendors as IBM, DEC and Hewlett-Packard. So Novell smartly reversed itself and now plans to ship an OS/2 requester with Named Pipes support in the third quarter. But that's just for the client side. Novell's broader OS/2 support plans have also undergone revisions, both in approach and ship dates.

Now we have Network for the '90s. As introduced last week, Network 386 is virtually an all-encompassing product concept. But it won't be until late 1990 that we examine some of the pieces. Keep in mind that Novell has already missed delivery deadlines for products that were announced in 1988 and promised for delivery in the first quarter of 1989, such as support for LU6.2 and Named Pipes APIs. Novell has talked about supporting Sun Microsystems' Network File System but has not released any other specifics or a release date.

Network 386's arrival heralds nothing but a change in name — and a potential for confusion — for Universal Network Architecture (UNA). Novell's blueprint for enhancing Network to provide mini and mainframe capability.

UNA, it seems, is no longer. In its stead, we have Network Open Systems (NOS). UNA was an umbrella strategy that did not live to complete Novell's open puzzle. NOS gets to pick up the pieces — that is, network management, global directory, Server Message Block support and NFS.

Behind all this smoke and confusion, there's a micro-based 32-bit network operating system packing the power punch of a minicomputer. Users putting together five-year network strategy plans owe it to their businesses to check out Novell's view of the future.

But if you're making plans around Network, just be sure to keep your eye on the bouncing ball.

Keefe is a *Computerworld* senior editor, networking.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Edgar Hayes, director of data processing for Los Angeles County for the past 10 years, has joined Lockheed Datacom as senior vice-president of the Western region. Hayes is responsible for all regional operations at Lockheed Datacom, a Teaneck, N.J.-based provider of parking ticket processing.

Hayes worked 30 years for Los Angeles County in a variety of data processing and computer programming positions. He was named deputy director of DP in 1973 and director in 1978. He is a former executive board member of the Southern California chapter of the Society for Information Management. Hayes holds a bachelor's degree in business management from Pepperdine University and is a U.S. Air Force veteran. He resides in Los Angeles.

Thomas W. Barton was recently promoted to director of telecommunications services at National Car Rental Systems, Inc. His responsibilities will include all voice and data communications hardware and software, data terminal and PC product identification at the Minneapolis-based car rental company.

Barton will oversee the design, installation and maintenance of the networks, which support National's Expressway Computer System, automated airline systems and a back-office computer system for licensees. Barton joined National in 1984 as manager of telecommunications support.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Constitution Road, Framingham, Mass. 01701-9171.

Lending a high-tech hand

Fannie Mae recognizes growth of ARMs, offers customers quick loan analysis on a PC

BY MITCH BETTS
CW STAFF

The Federal National Mortgage Association is attempting to take customer service to new heights with a personal computer-based service that it freely gives to its customers so they can analyze their loan portfolios.

Of course, Fannie Mae, as the association is known, hopes that once the loans are analyzed, the customer will see opportunities to deal with Fannie Mae rather than someone else in the secondary mortgage market.

"That's a risk we run," acknowledged Ian Clark, manager of operational control, who wrote the PC software. "We're hoping that by helping them analyze the data, they will want to do business with us. It's part of our big customer-service drive to make it easier to do business with Fannie Mae."

So far, officials said, that gamble is paying off. "We're bringing in a lot of deals that we probably would not have seen otherwise," said Janet Shatz, director of the customer trading desk at Washington, D.C.-based Fannie Mae.

The new Loan Stratification Service is provided to banks, thrifts and mortgage companies that originate complex, adjustable-rate mortgages (ARM). Using an MS-DOS-based microcomputer and loan data provided by the mortgage lender, the software analyzes the lender's portfolio of mortgages to determine the best strategy for pooling certain loans together for

trading in the secondary market.

"So many lenders don't know what they have [in their portfolio], and they don't know how to stratify, so they sit on it and do nothing," Shatz said. "Lenders need outside assistance to determine what loans are eligible to swap or sell."

The project was initiated by Fannie Mae's marketing department, which decided last August to make a big push into ARM securities and realized it needed a computerized tool for analyzing customer portfolios, said Clark and David Armijo, a senior business analyst in Fannie Mae's Operations and Systems Division.

The marketing department then turned to the systems division, which developed a working prototype on a mainframe. "From there, we started thinking about the best way to get it out into the market — and that's when the PC idea came up," Armijo said.

Fannie Mae officials said the project

was a response to the following market trends:

- There has been explosive growth in ARMs in the last seven years, with an uptick in the last month because of higher interest rates.
- New government regulations on risk-based capital make it more attractive for lenders to convert ARMs to mortgage-backed securities.
- Stratification of ARM portfolios is very laborious, because a portfolio may have several thousand loans, each one with a different interest rate, adjustment date and other variables.

Pumping up

With the growth in ARM volume, the ARM stratification service has hit the market at the right time, Armijo said.

"In the last month, we have been stratifying five to 10 portfolios a week," each one averaging about \$100,000, he said.

Lenders can convert their pooled mortgages into a mortgage-backed security, which is guaranteed by Fannie

Continued on page 53

STRATEGIC SYSTEMS

SNAPSHOT

Fannie Mae

Federal National Mortgage Association

- The third largest corporation in the U.S., based on assets (\$112 billion). Privately managed financial institution in the secondary mortgage market.
- Has federal charter to provide products and services that increase the availability and affordability of housing for low- and moderate-income Americans.
- Buys mortgages for its investment portfolio and guarantees mortgage-backed securities.
- Earnings (1988): \$507 million

SOURCE: GARTNER GROUP, INC.

CW CHART: FRANK C. O'CONNELL

Money, money, who's got the money?

BY CLINTON WILDER
CW STAFF

Rich is relative. How much information systems professionals earn depends on a multitude of factors, according to the sixth annual salary survey by Abbott, Langer & Associates in Crete, Ill.

Although the survey, sponsored by the Data Processing Management Association, produced 745 pages of statistical analysis, consultant Steven

Langer was able to draw a rough profile of the typical highest paid IS executive:

- He is a director of MIS or data processing with an MBA degree and at least 25 years of experience.
- He works for either a public utility, data processing or data entry services organization or for a company in paper products or the printing or publishing industry.

His company has more than 10,000 employees and annual revenue of at least \$500 million.

- He administers an information systems budget of more than \$2.5 million and oversees 10 or more technical subordinates.



- He is located in Detroit, Washington, D.C., New York, San Francisco, Philadelphia or suburban Connecticut.

Although the typical MIS director earns approximately \$49,000 per year, the highest paid executive with that title among the 761 organizations surveyed makes well in excess of \$200,000 in salary, bonuses and profit sharing.

In a statistical aberration, the highest paid job that the survey identified is not the director but that of the applications programming section head, at \$55,100.

The reason is because the applications job may not exist in the smaller, lower paying organizations, Langer said.

The director's median is lower, because he may have no people reporting to him in a smaller firm, Langer said.

At the low end of the spectrum, the lowest paid position was junior data entry operator, at a median salary of \$13,270 per year.

TAKING CHARGE

Alan J. Ryan

Selling, or selling out?



You hear them at just about every computer industry-related event: Information executives talking about

how they've managed to align their systems with their company's business plans, and executives expounding on how they've achieved lights-out data centers.

But the next most-likely-to-be-a-hot-topic to hit the conference circuits will be how companies are selling their internally developed systems — often to the competition — to bring in dollars.

The lucrative practice of selling systems is not without merit. In fact, selling information such as an internally developed database of customers to noncompetitors is very much like the sale of hard copies of mailing lists — it can bring in the bucks and cannot hurt the business. But some IS executives question whether it is morally correct to sell their sweat-stained work — which may have taken years to develop — to direct competitors.

One large energy company, which shall remain nameless here, is currently in such a dilemma. According to its vice-president of systems, the corporation began working on its far-reaching plan for systems 10 years ago, thus leapfrogging its competition.

During that 10 years, the energy company's plan has been modified and revamped as needed, and the final piece of the system was recently unveiled. Soon afterward, the vice-president said, calls started pouring in. The competition was calling to ask if it could come in to look at the system.

It can be argued that it is safe to show off such an achievement, since no competitor could possibly duplicate the energy company's efforts without years of development.

But at the same time, the company wants to carefully guard its secrets. "Do we really want to show our competitors what we're doing?" the vice-president asked. The corporation's chief executive officer has decided to show the system only to competitors with which the corporation is on good terms.

Another dilemma arose for the energy company when some

competitors asked if they could purchase the system or at least part of it.

The fight has now begun over whether there are generic parts of the system that can be slightly modified and sold — which would help defray the development costs — or whether selling any part of the system would be simply selling out.

The energy firm is not the

only one faced with this dilemma. According to a recent study conducted by MIT and Big Eight accounting firm Arthur Young, selling information systems will become much more common in the 1990s.

According to the study, once a company can separate the proprietary parts of a system from the generic parts, that system can then be sold to other

sources such as other customers, industry competitors or investors.

In theory, the MIT report presents a logical scenario. The IS department, which often accounts for a large slice of the corporate budget, can sell its work for profit to noncompetitors. The whole area could become self-sufficient if the cards are played correctly.

It is also entirely possible, however, that the more valuable systems for sale will be those that are sought after by direct competitors. When that is the case, IS officials will likely be hoping that their corporate executives can see beyond the dollar signs in their eyes.

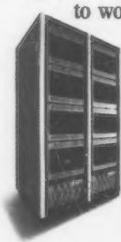
Ryan is a *Computerworld* senior writer.



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MANAGEMENT BRIEFS

Papers sought for DIAC symposium

"Directions and Implications of Advanced Computing" (DIAC), sponsored by Computer Professionals for Social Responsibility, is seeking papers for its symposium to be held July 28, 1990, in Boston. The DIAC symposium is searching for pa-

pers that address the range of questions at the intersection of technology and society.

Suggested topics include effects and sources of research funding, artificial intelligence and the conduct of war, autonomous weapons systems, soft-

ware development methodologies, community access and computerized voting. Other possible topics are civil liberties, computing and the law, computing and the workplace, computing for the disabled, uses of models and simulations, arbitration

and conflict resolution, computing in education and software safety.

For information on submission guidelines, contact the Computer Professionals for Social Responsibility, P.O. Box 717, Palo Alto, Calif. 94301.

Topic suggestions, nominations of speakers and proposed topic abstracts are now open for Com-

munication Networks '90, to be held Feb. 6-8, 1990, in Washington, D.C. Submissions must include topic name, suggested speaker, description, outline and speaker biography. Include your name and address and mail to David Bradway, Manager, Conference Planning and Development, IDG Conference Management Group, 20 Speen St., Framingham, Mass. 01701.

Fannie Mae

FROM PAGE 51

Mae and is much more of a liquid asset than a mortgage. Fannie Mae, in turn, earns a guarantee fee and fulfills its charter to provide liquidity and stability to the home mortgage market.

Loan stratification has been done by Wall Street brokerage houses using mainframe statistical-analysis packages, but that often takes one to two weeks and produces only a hard-copy printout. The PC-based analysis takes one day and allows comparison of up to 36 different pooling scenarios, Fannie Mae officials said.

"We made the big decision to go with micros to make it available to a broader market," including small lenders, Armijo said. He noted that third-party stratification services charge \$5,000 to \$10,000 to evaluate a portfolio, whereas the Fannie Mae service is free.

The software, written in Nantucket Corp.'s Clipper language, runs on IBM-compatible personal computers with at least 512K bytes of random-access memory. On an Intel Corp. 80386-based machine, the software can stratify 1,000 loans in three minutes, Clark said.



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*Datapro, *User Ratings of Network Management Systems*, September, 1988.

**International Data Corporation (IDC), *Quantitative Analysis of the Network Management Market*, October, 1988.

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CALENDAR

The role played by the user/MIS partnership in helping to generate clear, consistent and complete system requirements is one of the themes of a two-day training course slated for June 13-14 in Chicago. "The User's Role in Software Development," sponsored by Applied Information Development, is designed for business applications users and their MIS counterparts who work together to develop or purchase software.

Presentation topics include "The Need for a Strong User/MIS Partnership," "Participating in Managing a Project," "Roles and Responsibilities" and "Installing the System." For more information, contact Lisa Bowling, Applied Information Development, 823 Commerce Dr., Oak Brook, Ill. 60521.

MAY 21 - 27

University of California, Los Angeles I/S Symposium. Los Angeles, May 21-23 — Contact: University of California, Los Angeles, Information Systems Research Program, The John E. Anderson Graduate School of Management, Los Angeles, Calif. 90024.

Software Publishers Association Spring Symposium. San Diego, May 21-24 — Contact: Software Publishers Association, 1101 Connecticut Ave., N.W., Washington, D.C. 20036.

Testing Computer Software Conference. Washington, D.C., May 22 — Contact: Conference Staff, U.S. Pro-

fessional Development Institute, Suite 221, 1734 Elton Road, Silver Spring, Md. 20903.

Technology for Today Symposium. Los Angeles, May 22-23 — Contact: California Circuits Association, 5662 Rogers Drive, Huntington, Calif. 92649.

SQL Database Servers: Application Building Benchmarks. Los Angeles, May 22-24 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01810.

Navy Micro '89. Virginia Beach, Va., May 22-25 — Contact: Nardac Norfolk, Navy Micro '89, Norfolk, Va. 23511.

Supercomm '89. Anaheim, Calif., May 22-25 — Contact: USTA/TIA, Supercomm Office, Suite 600, 150 N. Michigan Ave., Chicago, Ill. 60601.

Software Engineering Strategies Conference. Vienna, Va., May 23-24 — Contact: The Gartner Group, 56 Top Gallant Road, P.O. Box 10212, Stamford, Conn. 06904.

Conference for Information Engineering Issues. Arlington, Va., May 23-25 — Contact: James Martin Associates, Suite 200, 1850 Centennial Park Drive, Reston, Va. 22091.

Monterey Software Conference. Monterey, Calif., May 23-25 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01810.

Total Recovery Planning System. New York, May 24-25 — Contact: CHI/COR Information Management, Suite 1550, 10S. Riverside Plaza, Chicago, Ill. 60606.

Capacity Planning and Modeling. Toronto, May 24-26 — Contact: The Institute for Information Management, P.O. Box 361556, Milpitas, Calif. 95035.

Association for Systems Management Systems Conference. Catonsville, Md., May 25 — Contact: Stephanie O'Hara, University of Maryland, Baltimore County Campus, Academic Computing Services, Baltimore, Md. 21228.

Batch Process Automation Seminar. Chicago, May 25-26 — Contact: Andrew Chatha, Automation Research Corp., 266 Main St., Medfield, Mass. 02052.

NCGA Factory Floor Graphics Briefing. Clearwater Beach, Fla., May 25-26 — Contact: National Computer Graphics Association, Suite 200, 2722 Merrilee Dr., Fairfax, Va. 22031.

Electronic Networking Association Conference. Allentown, Pa., May 25-28 — Contact: Lisa Carlson, Meta-systems Design Group, Suite 103, 2000 N. 15th St., Arlington, Va. 22201.

MAY 28-JUNE 3

1989 Information Management Conference: Canada's National Data Administration Conference. Toronto, May 29-31 — Contact: John Hobbs, Information Resource Management Association of Canada, Suite 311, 55 McCaul St., Toronto, Ont. M5T 2W7.

Canadian Information Processing Society Congress '89. Edmonton, Alta., Canada, May 29-June 2 — Contact: Canadian Information Processing Society, P.O. Box 1277, Main Post Office, Edmonton, Alta. T5J 2M8.

Application Developer/Reseller Conference. Austin, Texas, May 30-June 1 — Contact: Michael Prentice, Ryan McFarland Corp., Suite 290, 6907 Capital of Texas Highway N., Austin, Texas 78731.

Inter-Ram Conference. Monterey, Calif., May 30-June 2 — Contact: Robert Filipovits, Pennsylvania Power & Light Co., P.O. Box 3326, Wescosville, Pa. 18106.

Smart Card Applications and Technologies Conference and Showcase. Washington, D.C., May 30-June 2 — Contact: SCAT Conference, The Information Exchange, 2026-C Opitz Blvd., Woodbridge, Va. 22191.

Portable Computing '89. Santa Clara, Calif., May 31-June 1 — Contact: IDG Conference Management Group, P.O. Box 9171, 20 Speen St., Framingham, Mass. 01701.

Advanced Security and Identification Technology Conference and Exhibition. Arlington, Va., May 31-June 2 — Contact: ASIT '89, 2026-C Opitz Blvd., Woodbridge, Va. 22191.

JUNE 4-10

A/E/C Systems '89 Computer and Management Show for the Design and Construction Industry. Anaheim, Calif., June 5-8 — Contact: A/E/C Systems '89, P.O. Box 11318, Newington, Conn. 06111.

JUNE 18-24

Computerworld Perspectives 1989: The Annual Executive Conference for Strategic Information Management. New York, June 20-21 — Contact: Carter Communications, Suite 31-A, 211 W. 56th St., New York, N.Y. 10019.

PC Expo. New York, June 20-22 — Contact: PC Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Interconnections '89, The Independent Computer Consultants Association's 12th Annual National Conference. San Diego, June 21-24 — Contact: ICCA, P.O. Box 27412, St. Louis, Mo. 63141.

JUNE 25-JULY 1

Intelligent Network Comforum. Chicago, June 26-27 — Contact: Professional Educational International, Suite 740, 303 E. Wacker Drive, Chicago, Ill. 60601.

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PRODUCT SPOTLIGHT

MANUFACTURING TECHNOLOGIES

Fresh takes on the shape of automation

BY SUZANNE WEIXEL

At the Ingessoll Milling Machine Co. in Rockford, Ill., they have a name for the form that manufacturing automation will take in the next few years. That name isn't CIM (computer-integrated manufacturing) or even CIE (computer-integrated enterprise). Ingessoll has already moved on to COM — computer-optimized manufacturing.

Staying on the forefront of automation is something of a tradition at Ingessoll Milling, one of six independently owned subsidiaries of Ingessoll International, Inc. The company, which manufactures large custom equipment, automated many phases of its operations during the 1970s.

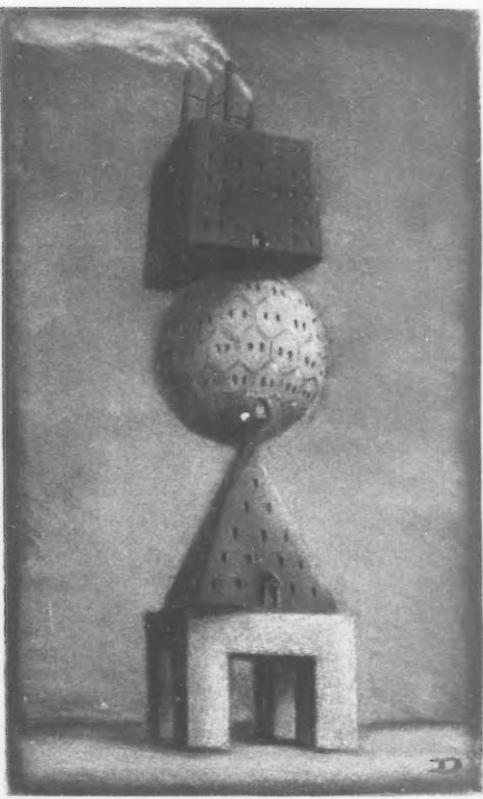
In 1980, it undertook large-scale integration of business, manufacturing and engineering systems. It has now reached the stage at which it can consider the possibilities introduced by a combination of artificial intelligence and a central database.

As the result of a massive re-programming effort, all critical application programs are now joined in a massive central database, which allows multiple concurrent access from terminals at any of the company's facilities. Eight million access requests are processed every day.

Now that the infrastructure of integration is in place, the next job, says Lawrence Hines, manager of product systems, manufacturing integration, "is to get smart about using it."

George J. Hess, vice-president of systems and planning, says that the optimized system the company envisions will build on the current integrated information system to capture the

Weixel is a free-lance writer based in Framingham, Mass.



BOB DAHM

logic of the business' best experts and make it available to less experienced personnel.

Such a system, Hess explains, lets everyone operate at a higher level of performance. It will also help the company shift from the traditional pyramid management method to an organization with fewer management levels, less restraint, less need for supervi-

sion and more creativity.

Although the concept of optimization is still a new one for many organizations, some have begun to apply it to their own optimization efforts.

One is Monsanto Chemical Co.'s Fibers Division in St. Louis, where integration and optimization are one and the same goal. The division is integrating the

manufacturing and business systems in each of its four plants, starting with the Pensacola, Fla., plant. Throughout the process, the division is applying just-in-time (JIT) and Total Quality (TQ) manufacturing philosophies to optimize the systems as they are being installed.

As Carol Holmes, information systems manager, notes, "You don't have to wait to finish one stage before starting the next." At Monsanto, optimization is the goal; integration is the means.

Holmes has definite ideas about technologies that she would like to use — if they existed. These include user-friendly engineering workstations; a development language that could run on different computer platforms; and compound document storage systems capable of utilizing anything from handwritten notes to voice notations.

Neither Hess' action plan nor Holmes' wish list are typical of most manufacturers. Few companies have devoted as much time or thought to the role of automation as Ingessoll, and few are so far along with technology utilization that they are looking down the road for more.

According to Douglas Boike, principal and senior member of the technology and operations practice at Booz, Allen & Hamilton, Inc. in Cleveland, most manufacturers are overwhelmed by the thought of keeping up with manufacturing technologies.

"People are cognizant of the concepts involved," Boike says. "But actually taking steps to do it is another matter. Software costs alone can drive you crazy."

Even if you can keep up, moving on to the new may not make sense, unless you are sure that you have extracted full value from current technology, says Ben Kaminski, president of Computer-Aided Manufacturing International, Inc., an Arlington, Texas-based consortium of manufacturers. The issues facing manufacturers right now, he notes, are not so much how to make use of new technologies but how to more efficiently apply technologies they already have.

For many manufacturers that are grappling with automation

INSIDE

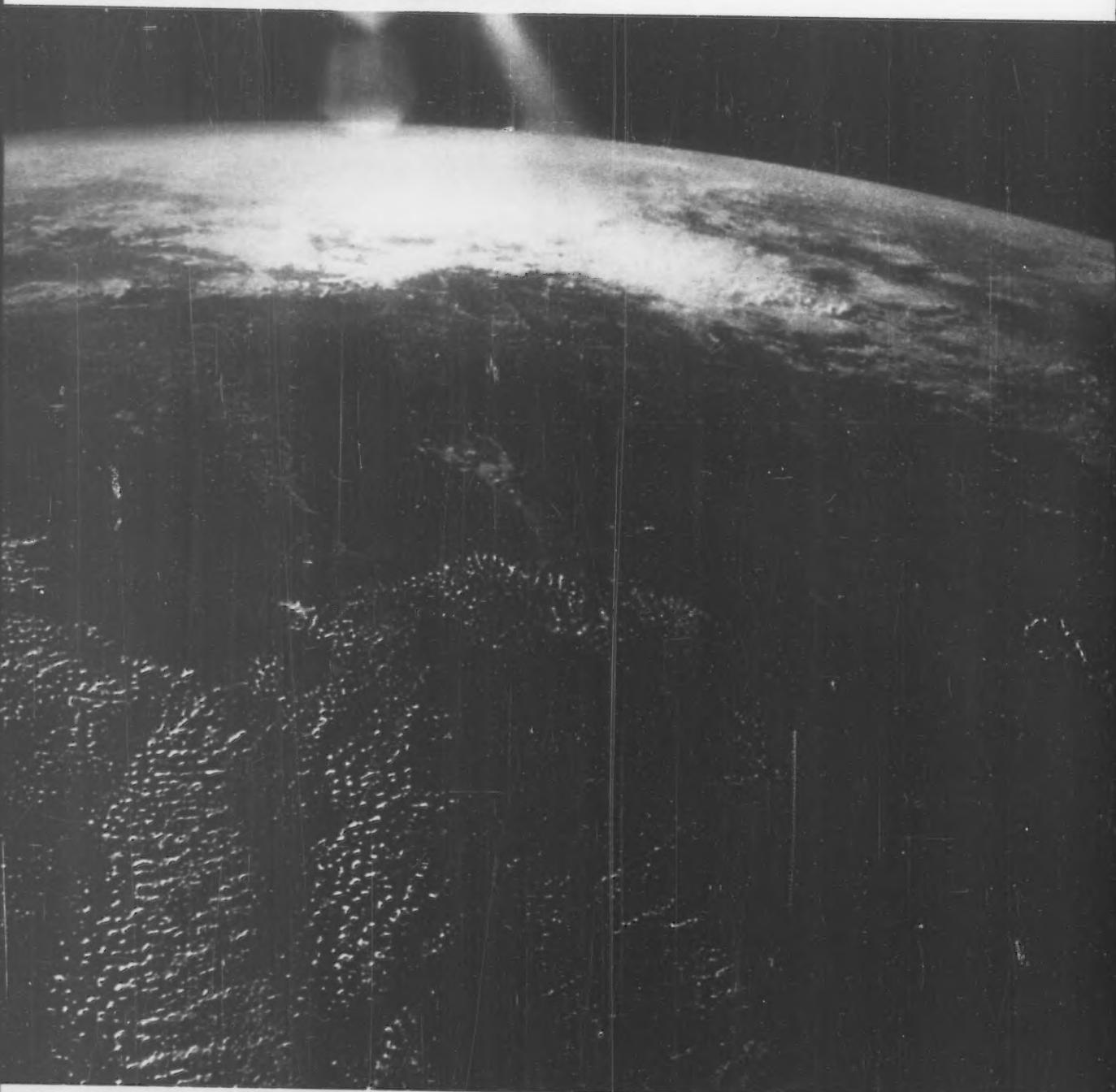
Make Way for Micros

Although still mostly on the sidelines, PCs are making their move to center stage on the factory floor. Page 62.

Integrator's Apprentice

There's work for CASE in computer-integrated manufacturing, but hiring is slow. Page 63.

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Fresh takes

CONTINUED FROM PAGE 55

on that plane, the greatest breakthroughs are coming not in the form of advanced systems but in fresh ways of defining need and combining conventional methods.

In 1986, for example, Codex Corp., the Mansfield, Mass.-based manufacturer of modems, multiplexers and communications network systems, threw away its plans for a fully automated multimillion-dollar high-rise inventory warehouse and began to reexamine its assumptions.

What the company had been trying to accomplish with its state-of-the-art warehouse plan was to improve its position in the marketplace through improved response to customer demand. But when top manufacturing management examined the state of manufacturing at Codex, the state of the market and the state of manufacturing in general, they realized that they had been trying to add when they should have been subtracting.

A warehouse system "just wasn't the answer," explains John Comey, manager of advanced manufacturing systems. "To reach our goal of complete customer satisfaction, we didn't need to store more inventory. We needed to eliminate inventory altogether."

Armed with that realization, Codex embarked on a mission to achieve JIT manufacturing. JIT gets its name because



Monsanto's Holmes

products are manufactured "just in time" to deliver them, not before. It makes use of demand-based systems based on flexible production, small lot sizes and high quality to achieve its goal of low or even zero inventory. JIT can be applied internally to reduce work-in-progress inventory or in conjunction with suppliers to reduce raw materials inventories.

A factory operating on JIT principles uses a "pull" system, in which rates of production are set for one- or two-week schedules and real orders pull production through the plant. This is in contrast to manufacturing resource planning (MRP) systems, which operate on the basis of long-standing master schedules and push materials out the door at a predetermined pace.

Right now, many U.S. companies are moving toward JIT in an effort to change their overall operating practices and improve productivity.

"You'd be hard-pressed to find anyone in the Fortune 500 who isn't at least experimenting with just-in-time," says Tony Frisia, president of Advanced Manufacturing Research, a market analysis company based in Cambridge, Mass.

Francia attributes the shift to JIT techniques to an awareness of what it really means to be a world-class competitor. "It's the only way to survive in the global market," he claims.

Also, he points out, U.S. companies are finally realizing that some of the problems they have encountered in manufacturing

over the years are not aberrations.

"Inferior quality, long waiting times and customer dissatisfaction are not just blips that are going to go away," Frisia maintains. "Companies are going to have to do something about them."

At Codex, the company had to rethink and redesign its manufacturing strategy, Comey says, in order to improve its responsiveness to market demand and its competitive position. Codex estimates, for example, that inventory costs for Japanese competitors were averaging roughly one-third of its own.

To achieve its goals of reduced cycle times and improved quality, Codex wanted to combine its existing MRP technology with JIT production methodologies.

"People tend to think of MRP and JIT as mutually exclusive when, in fact, they make a very good fit," Comey says. "The key is to separate the planning side of

the business from the execution side. If you can drive material planning from MRP, drive execution from sales orders and still maintain the MRP closed-loop philosophy, you've got it made."

Codex's business systems are based on MSA Advanced Management, Inc.'s AMAPS MRP II software. To enable the separation of MRP from production, Codex added MSA's Schedule Managed Production module, which provides rate-based scheduling capabilities. Other systems include electronically linked computer-aided design (CAD) systems and a relational database management system from Computer Associates International, Inc. The primary hardware system is an IBM 3084 mainframe, but Digital Equipment Corp. VAX systems are also used.

Effective implementation of both JIT and MRP allowed Codex to migrate from a flexible factory concept to a focused factory one. The company eliminated work orders by going to repetitive-style production. It installed some robotics and implemented a pay-for-skills program so it could move manufacturing personnel between different jobs. It is also developing a supplier partnership program.

As a result, manufacturing cycle times have been reduced by 42%. Output on the line has been increased by 45%, without an increase in manpower. Inventory turns have doubled, and semifinished inventory has been reduced to zero.

Stephen Schaus, consulting manager at Andersen Consulting, a division of Ar-

thur Andersen & Co. in Hartford, Conn., says mixing MRP and JIT can be effective, particularly in the short term. "Few companies have the luxury of setting up a new factory," Schaus notes. "They need to reorganize, train and implement new techniques — a process that may take years." The goal, he says, is the metamorphosis of MRP into something more integrated with execution. He calls it JRP: Just-in-time Requirements Planning.

"A JRP environment takes advantage of the planning power of MRP to tell production what to make, how much to make and when to make it," Schaus says.

Dan Ciampa, president and chief executive officer at Rath & Strong, Inc., a Lexington, Mass.-based consulting company, claims that over time, JIT will dramatically diminish the need for MRP. What JIT will push, he says, is commitment to methods of Total Quality.

To implement JIT, certain things must be in place. Setup costs must be low so that small lot sizes can be produced in response to demand. Workers must be flexible enough to change workstations from one production process to another in response to demand. But most important, quality must be high so that a product is manufactured right the first time.

"It's a commitment to Total Quality that gets the company in a customer-oriented mindset," Ciampa says. "Just-in-time eliminates unnecessary components of the manufacturing process and, in doing so, simplifies the process. Together, TQ and JIT set the stage for CIM."

At A. B. Chance Co., a supplier to the utility and telecommunications industries based in Centralia, Mo., quality is a focus of automation efforts. "A lot hinges on quality level," says Gene McKenzie, a process control manager. "If we have confidence in our quality, we can move to the next step, which in our case is reducing lot sizes."

The team-based quality program that is now in place at A. B. Chance includes automated data collection technology for control charting (2,000 control charts are now in use) in addition to process improvement projects and employee training. "The big thrust of the program has been training," McKenzie says. "We are emphasizing a team approach instead of an individual approach."

A local-area network that will provide real-time access to quality-related production data is in the works. It will link all

Top guns

Arthur Young has developed the concept of "World-Class Performance" in manufacturing as a set of goals for CIM to achieve. The firm defines a world-class performer as a manufacturer that meets the following criteria:

- Annual number of inventory turnovers (raw and work-in-progress): 100.
- Rejects per million (work-in-progress only): 200.
- Customer service satisfaction levels: 99%.
- Product cost, as compared with Japanese competition: -10%.
- Average product/model change-over setup time: Less than five minutes.
- Time required to switch from one product to another: Less than one day.
- Machine utilization: 95% of total shift capacity.
- Value-added customization time: Less than 50% of total lead time.

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Codex's Comey



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Pam knew that the choice of hardware and software platforms was critical. She was also convinced the job could be done completely with PCs.

"This operation would require PCs with advanced technology, superior performance, and overall reliability," she recalls. "COMPAQ PCs met my needs."

But Pam also knew that neither standalone PCs nor LANs would suffice—the operation needed multiuser connectivity at each site, multitasking power at each workstation, and high-end performance overall.

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Each COMPAQ PC runs SCO Lyrix® word processing, SCO Professional™ spreadsheets, custom database modules, and SCO™ VP/ix™ to run DOS programs directly under SCO XENIX. Pam and her staff can even support the site remotely by modem.

"My own DESKPRO 386 supports an entire department with sixteen users and three printers," she says. "It is a complete office automation machine!"

The power of the COMPAQ/SCO workgroup platform amazes me," Pam says. "And the upward compatibility and add-on flexibility of both the hardware and software let us keep building the best systems to keep our paratransit operation in high gear!"

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four of the company's plants. "The LAN will let design engineers see immediately what we can and cannot manufacture as well as let manufacturing management know what's going on on the shop floor at any given time," McKenzie says.

So far, scrap has been reduced 20% and rework reduced 62%. With every improvement, the comfort level at A. B. Chance is rising. McKenzie says, "It's an evolutionary process. With each success, we back off and look at what we've done. Then we decide how to enhance it."

Building confidence is a necessary part of keeping up with change. Over the years, manufacturers have been put off by the cost of manufacturing automation, the lack of a track record for proving success and the sheer complexity of the process.

MANUFACTURERS WANT to apply technology where it makes sense — where it saves money and enhances quality."

DOUGLAS BOIKE
BOOZ, ALLEN & HAMILTON

The best way to cope with complexity and improve your odds of success, Boike says, is to draw up a long-term plan that relates manufacturing automation to business direction. "It sounds trite," he admits, "but a strategic plan for the entire enterprise is the only way to succeed."

In 1987, Fleetguard, Inc., a filters manufacturer based in Cookeville, Tenn.,

did just what Boike advises.

Recent expansion had already brought the company to a point where it was operating six manufacturing plants and 16 locations for distribution, including Europe and other areas of the world as well as joint ventures in Korea, Mexico and India. This growth was expected to continue. Management was looking for a way to

maintain control without holding back expansion. One way of doing that, they decided, was to implement a fully integrated worldwide manufacturing system.

Looking at the critical success factors, the company came up with a list of long-range systems requirements that included MRP, CAD, computer-assisted engineering and automated cataloging and distribution. All of this would boost the information services budget by more than 50%, but the company decided that it had to bite that bullet.

"We felt we needed to get the base business systems in place to support the growth and link our international areas," says Tom Aitken, manager of information planning."

Large-scale changes included switching hardware systems. "We had Data General, IBM and Unisys [machines] in-house," he recalls, "but we changed to Digital because they offered a better platform for what we planned to do." Specifically, DEC offered flexibility. "They pro-

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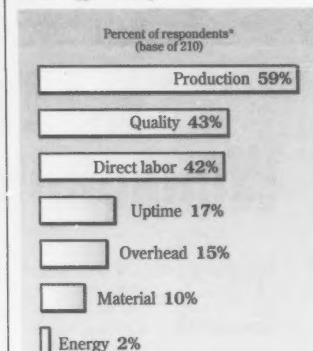


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Supersavers

Output, rather than resources, is where most users of manufacturing automation see the biggest savings



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vide networking capabilities that are vital to us," Aitken says. "With the DEC systems, we have a single operating system throughout all areas of the organization."

One of the project's goals is to distribute information and computing power to users. Aitken explains, "We want the person at the warehouse to be able to run his business as he sees fit to suit his location."

Erik Keller, senior research analyst at Gartner Group, Inc., says decentralization such as Aitken describes is becoming a prominent feature of many manufacturing automation efforts. "Where applications such as MRP used to be done at corporate headquarters, now each site has its own local control," Keller notes.

Eventually, Aitken says, the key to achieving the level of integration they want at Fleetguard will be to have distributed databases throughout the organization. That technology is still a few years away, he admits, but some DBMSs are starting to show promise.

As ambitious as its plans may be, Fleetguard is not trying to do everything at once. Instead, it looks at the process as incremental and continuous.

That is typical of the new pragmatism that manufacturers bring to their automation efforts, Boike explains. "Manufacturers want to apply technology," he says, "where it makes sense — where it saves money and enhances quality." •

The appeal of R&D liaisons

Every MIS manager knows that familiar feeling. The day you finally make a purchasing decision, a vendor announces something faster, smarter and cheaper. How's a manufacturer supposed to keep up?

One way to stay current is to get the vendors to keep up with you, and these days that is not hard to do. According to Douglas Boike at Booz, Allen & Hamilton, Inc. in Cleveland, the lure of reduced selling costs and stable affiliations makes manufacturing systems vendors anxious to pursue all kinds of sharing relationships.

The Fibers Division of Monsanto Chemical Co. in Pensacola, Fla., is involved in this type of an exchange program right now. Monsanto is currently conducting a major research and development

WORKING with customers to understand their point of view and their customers' point of view is essential to doing business in the future."

THURMAN PAYNE
FISHER CONTROLS

ment collaboration with both Digital Equipment Corp. and Fisher Controls International, Inc.

In 1988, the three firms embarked on the DFM Joint Project to identify methods of developing automation systems at Monsanto's Pensacola operation as well as methods for integration and subsequent plant optimization.

The project's intention is not to produce a commercial system, based on Monsanto's model. Instead, the vendors are helping Monsanto put together what it needs in return for knowledge they hope will assist them in future product development.

DEC first approached the Fibers Division with the idea of a development collaboration. Almost 75% of all computing at the Pensacola plant is done on DEC VAXs, Vaxclusters and 60 PDP machines used for process control.

DEC was interested in working out such a relationship because of the insight it could acquire into applications for its products in integrated manufacturing for the process industry. This, says Patrick Hurley, market segment manager in computer-integrated manufacturing (CIM) marketing at DEC, is a market that is currently worth approximately \$900 million worldwide and expected to grow.

Fisher Controls, providers of the process control software used by Monsanto on its DEC machines, was drawn into the process by Monsanto and expects similar benefits.



Monsanto's
del Toro

"The technical communications involved in CIM require close coordination between all parties involved," says Thurman Payne, Fisher Controls' CIM technical consultant.

More than surviving

"At this point in time, companies are looking beyond mere survival; they are trying to make the most out of whatever resources are available," Payne points out. "Working with customers to understand their point of view and their customers' point of view is essential to doing business

in the future."

The offer came at a fortuitous time for the Fibers Division, which had just set a challenging goal for itself: increasing productivity at each of its four plants by 50% within three years. According to Jorge del Toro, CIM project manager at Monsanto, the only way to meet this goal was to become better informed about technological options.

With access to the vendors' resources and expertise, del Toro says, the route up the learning curve is a lot easier. Implementation of key projects is speeded, and the division has early access to CIM technologies that can be customized to its specifications.

A project steering committee including representatives from all three of the

companies has identified 80 systems projects that will have to be completed if the division is to meet its productivity goal. The first phase of implementation is expected to take from 18 months to two years.

The cooperative nature of the DFM Joint Project means that each company shares resources and costs only. No formal contract exists between the three companies.

"It is not a business partnership," del Toro emphasizes. "Monsanto makes whatever purchases it would otherwise make; Digital and Fisher provide human resources and training. Financial issues are handled as we go along. So far, it has been amazingly smooth."

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PCs bloom on plant floor

BY LARRY STEVENS

At Rocky Mountain Bank Note Co. in Denver, a network of 21 IBM Personal System/2s is gradually replacing an IBM 4341-based manufacturing system, putting the check-printing company on the edge of manufacturing technology.

Two years ago, the company decided to decentralize its computing functions in order to provide all divisions with ade-

quate computing resources. One of these divisions was manufacturing, which was running a variety of tasks on the corporate mainframe, ranging from scheduling to plant floor operations to inventory.

In planning the project, Craig Vanderlan, the company's director of materials management, considered a minicomputer and dedicated terminals. Instead, he chose to install a PS/2-based local-area network because he believed it would be less expensive and more efficient.

Stevens is a free-lance writer based in Springfield, Mass.

Personal computers are becoming commonplace on the manufacturing floor, where a large range of functions — from store-and-forward tasks to inventory control — are benefiting from the lower costs and increased flexibility and efficiency that this class of equipment offers.

Andy Chatha, president of Automation Research Corp. in Medfield, Mass., estimates that more than 100,000 PCs are sold for manufacturing use every year and that the current installed base of PCs in manufacturing is more than one million.

These numbers are bound to increase, Chatha predicts, as faster PCs, such as those based on Intel Corp. 80286 and 80386 chips, replace the existing population of IBM Personal Computer XT- and AT-class machines. When connected in

efficient LANs, he adds, these more powerful machines can rival the speeds of many minis and mainframes.

Rocky Mountain's Vanderlan did have some concerns about whether the PS/2s would be powerful enough to run the same type of manufacturing resource planning (MRP) functions that he had run on the 4341. "We expected that we would have to accommodate ourselves to slower response time in some areas," he admits.

But he found that the degradation was so small that no adjustments were necessary. For example, three weeks ago, when he did his first MRP explosion, the task took 45 minutes, only a few minutes longer than it had taken on the 4341.

Price is another factor. The cost of PC-based manufacturing LANs is only about 35% to 50% of the price of mini hardware and software. Chatha says, "With the power of PC-based systems so high and the cost so low, choosing between a PC system and a minicomputer system is not a hard decision for many manufacturers."

Software availability is still a concern

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PERSONAL computers are becoming commonplace on the manufacturing floor, where a large range of functions are benefiting from lower costs and increased flexibility and efficiency.

for some users. Chatha contends, however, that an ample supply of off-the-shelf PC-based manufacturing packages is available, including MRP systems, quality control packages, job scheduling tools and tracking systems. These packages, he says, perform all the same functions as software created for larger computers.

To downsize MRP from the mainframe to PCs, Vanderlan purchased Micro-Max MRP, an integrated manufacturing package from ASA/Micro-MRP, Inc. The product includes a number of modules such as planning, shop-floor control and purchasing.

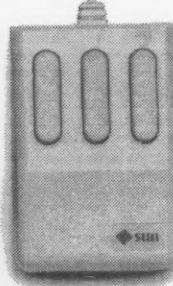
To minimize disruption, Vanderlan is implementing the modules one at a time. So far, he has installed the inventory, master scheduling and MRP modules. In each implementation, he found little difference in response time between the PC and the mainframe.

The only disadvantage Vanderlan has found in using PCs is backup, which has to be performed manually. On the IBM system, the task was done automatically. Other than that, he says, "everything we hoped for with PCs came true; things we worried about never happened."

While Rocky Mountain Bank Note's PC-based LAN represents the leading edge of the downsizing movement, Chatha says that most PCs are used for store-and-forward or terminal emulation. He says, "Telling management that you want to buy a PC for \$5,000 to replace a \$20,000 dedicated terminal is a lot easier than saying you are going to disconnect from the corporate mainframe. PCs are now used mostly as windows into manufacturing rather than controllers."

An example of this more common use of manufacturing PCs is found at Coleman Cable, Inc. in Chicago. The company's

Continued on page 64



T H E O P E N C H A L L E N G E

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There may be jobs opening for CASE in manufacturing

BY SUE ANNE HAWLEY

Practicality and family resemblance suggest that computer-aided software engineering (CASE) should occupy a prominent place in any collection of tools and techniques for manufacturing automation. That has not happened yet, but there are signs that both vendors and users are starting to recognize the logic of the connection.

After all, the automation of manufacturing is driven by complex software, and the appeal of CASE in the business MIS arena has been its ability to speed and simplify creation of complex systems. Besides, many of the principles behind CASE and computer-integrated manufacturing (CIM) are the same.

"Just as the automation of manual methods on the factory floor eliminates repetitive steps and reduces errors, automation of software development techniques increases the quality and productivity of software systems development," says Roger Pressman, president of R. S. Pressman & Associates, a consultancy in Orange, Conn.

Until recently, CASE product vendors have exhibited little interest in exploiting that connection, concentrating instead on large-scale commercial development customers such as banks and insurance companies. That situation is changing, however, as manufacturing automation grows more information-intensive. In addition to CASE vendors, producers and users of manufacturing automation systems are starting to realize that there are a number of areas in which CASE products can play an important role.

Supporting CIM

One area in which CASE could be helpful is in developing complex, integrated information systems to support computer-integrated manufacturing (CIM).

"CIM is not the automation of the factory floor — it is the integration of information," says Doug Henson, partner in charge of the Northeast Manufacturing Industry Group for Deloitte Haskins & Sells. "Until a year ago, manufacturers focused on 'point' solutions, addressing specific problems in a vacuum; now, they are looking for broader solutions."

At least a dozen different vendors, including Deloitte Haskins, are now marketing tools that can be used at the top planning levels to model the flow of information throughout the organization and into the manufacturing process to yield optimal design. All potentially computerized information is handled by the strategic planning portion of many of these tools. While not all CASE tools are intended for use in strategic planning or modeling areas, those from the upper CASE category typically offer this capability.

A second area of opportunity for CASE is in the analysis of a manufacturing process. Real-time control of a manufacturing process is a highly automated, software-driven activity. Software is the

essential element in robots, programmable controllers and numerical-control machine tools. Even multimillion-dollar flexible machining systems are as dependent on their software as they are on their hardware components.

Already more than 20 CASE tools on the market are specifically designed to de-

velop manufacturing process software. These include specialized development, design and analysis tools; simulation tools; and systems integration tools.

Plant work

Job openings for CASE also exist on the factory floor. Many manufacturing systems require additional programming for customization to a user's site. Furthermore, interfacing one factory automation system to another often requires sophisticated programming.

"With a classic set of manufacturing functions, including engineering, production, procurement, logistics and finance, you need all of these people to be speaking from the same shared vision of the product definition," says David Schoeff, the

senior vice-president of sales and marketing at D. Appleton Co., a Manhattan Beach, Calif.-based vendor of CASE solutions for CIM environments. "CASE prevents the redesign of a product or system as the data goes from one phase, or department, to another," he adds.

The tools in this category are primarily for systems design and analysis. They usually fall into two categories — personal computer-based and mainframe-based — and Appleton offers versions of its tool in each size class. There are currently around 60 PC packages available and between 20 and 30 for the mainframe.

Many CIM industry experts agree that manufacturing organizations have been apprehensive about experimenting with a relatively new technology like CASE in

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the product-production portion of their businesses. But CASE's entry into manufacturing may be propelled as manufacturing software developers and end users alike begin to recognize the applicability of CASE to their particular needs.

Vendors of factory automation systems do not currently represent a major market for CASE tools. Cadre Technologies, Inc., a CASE vendor that has tried to target this group, says that developers of manufacturing automation currently represent only 10% of its customer base. Still, there is evidence that some producers of manufacturing systems are beginning to see CASE as a means of imposing some consistency and coherence on a complex development task.

"In our environment, different soft-

ware products must work together; the designs must be cohesive," says Chet Moutrie, vice-president of product development at Intercim Corp. in Minneapolis. "By helping to analyze and manage the design process and the source code, CASE tools could provide a significant benefit." But while Moutrie recognizes the potential of CASE, he too is reluctant to dabble in the technology because of its relative newness.

Until vendors of manufacturing software such as Intercim adopt CASE technology to develop their products, end-user manufacturing organizations are not likely to take the plunge.

"When the vendors of manufacturing software packages move more toward CASE in the development of their own

systems, manufacturers will begin to use CASE as they extend these packages to meet their own unique needs," says Marty Bogenschutz, manager of the Business Information Program for Cincor Systems, Inc., which offers both CASE tools and manufacturing software.

Manufacturers are more interested in CASE than they used to be, however. That fact is evident when you listen to Steven Sellin, technical specialist in CIM at Cummins Engine Company, Inc., a Fortune 500 manufacturer that is heavily involved in CIM. "More and more," he says, "we realize that we cannot purchase exactly what we need in the area of interfaces between different automated functions on the factory floor. CASE tools would be helpful when a company is build-

ing its own bridge from one software package to another, especially when dealing with databases."

Although the climate is becoming more favorable, CASE tool vendors need to be aware that neither vendors nor users of manufacturing software are about to accept retreads of existing products. Potential manufacturing users of CASE tools, such as Sellin and Moutrie, are looking for products oriented to their environment-specific needs.

"Most of the CASE tools I am familiar with seem more oriented toward commercial application development, and I need a tool suited to an environment like ours," Moutrie explains. "I'll look for a tool that is easy to use; it must be an aid to productivity, not a hindrance." *

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PCs

CONTINUED FROM PAGE 62

wire and cabling manufacturing facility collects a wide range of data from the shop floor, including receiving information, receipts from work and purchase orders, shipments to customers and work-in-progress data. The information is entered using scanners, computer keyboards and handheld computers.

Two years ago, Coleman Cable used dumb terminals to transmit the collected data directly to the company's IBM System/36. Now, all the data is first collected and stored on seven PC AT's on the shop floor. Approximately once a day, the data is sent to the System/36.

"We're making extensive use of PCs," says Murray Horwitz, Coleman's MIS director. "But everything still revolves around our System/36."

The biggest advantage of using PCs for this store-and-forward function, he notes, is that all the processing eggs are not in one basket. Previously, if a computer went down, data collection would have to stop until the computer was back on-line. Now, even if the System/36 goes down, data can be held for up to three days in the PCs before the hard disk fills up.

A second advantage to using PCs is that each machine can perform multiple functions. So when a PC is not collecting data, it can be used for spreadsheets, word processing or other applications. For example, a PC AT replacing a dedicated Digital Equipment Corp. PDP-11 that controlled an extrusion process will be used for other plant and office functions.

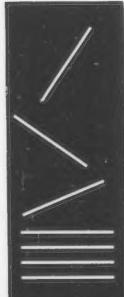
Future gains

Most recently, Horwitz has started experimenting with using PCs in plant processes. For example, in one task, serial numbers are printed on wires using an ink-jet printer. The number sequence is controlled through a keyboard in a proprietary controller. By replacing the controller with a PC, most of the work of inputting numbers is automated.

In addition to power gains, two trends are expected to propel PCs into manufacturing operations: the new generation of graphics chips, which will enhance the quality and lower the cost of graphics boards, and Unix-based PCs.

Chatha notes, "In the future, we'll see PCs providing more integration, more flexible databases and easier to use human interfaces." These developments, he maintains, will signal the beginning of the end for terminal-oriented, traditional factory automation systems. *

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MRP II software

COMPANY	PRODUCT	TARGET MARKET	TOTAL NUMBER OF MODULES	MAJOR MODULES	hardware required	TRANSACTIONS UPDATED IN REAL TIME	NET CHANGE OR REGENERATION LOGIC-BASED	JOB SHOPS OR PROCESS PLANTS	DISTRIBUTION RESOURCE PLANNING	TOOL PLANNING AND SCHEDULING	INTEGRATED ACCOUNTING / FINANCIAL SYSTEM	APPLICATION AND DBMS INTEGRATION	RELATIONAL DATABASE MANAGEMENT FEATURES	FOURTH-GENERATION DEVELOPMENT TOOLS	U.S. SITE LICENSEES	PRICE PER MODULE
ABC Computer Services, Inc. (313) 655-6155	ABC Repetitive Manufacturing	Repetitive manufacturers, automotive suppliers	6	MRP, product distribution/receivables, automotive communication, payroll, accounts payable, general ledger	NP	Most	Regeneration	Process plants	No	Yes	Yes	Yes	No	Yes	75	\$1,500-\$12,500
ADP Manufacturing Service Division (201) 994-0062	Manage 2000	Small to medium discrete manufacturers	22	Sales-order and repetitive processing, lot tracing, SPC, MRP, configure-to-order	All hardware running Pick	All	Both	Job shops	No	No	Yes	Yes	Yes	Yes	200	NP
Advantage Software (801) 375-0062	Navigator 4.0 MRP II	Manufacturers up to \$100 million	19	BOM*, inventory control, MRP, MPS*, purchasing, CRP*, financial	IBM PC, XT, AT and compatibles, Novell	All	Regeneration	Both	No	Yes	Yes	Yes	Yes	No	60	\$1,500
American Software, Inc. (404) 264-5296	American Software's MRP-8	Process, discrete and repetitive manufacturers	28	Demand forecasting, purchasing, inventory control, accounting, MPS, MRP, BOM	IBM System/38, AS/400, 9370, 4300, 3030, 3080, 3090 series	Most	Both	Both	Yes	Yes	Yes	Yes	Yes	No	700	NP
Andersen Consulting (312) 580-0069	MAC-PAC	General manufacturers	12	SIM facilities, engineering and cost management, JIT* requirements planning, MPS, order processing	IBM 360, 370, 3030, 3080, 3090, 4300, 9370 series; DEC VAX	All	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	80	\$25,000-\$460,000
	MAC-PAC/D	Aerospace and defense manufacturers	12	SIM facilities, engineering management, contract materials planning, contract borrow payback, contract accounting	IBM 360, 370, 3030, 3080, 3090, 4300, 9370 series; DEC VAX	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	35	\$40,000-\$900,000
Apollo Systems, Inc. (305) 584-6392	Manufacturing Management Series	Small manufacturers, job shops of \$1 million to \$50 million	21	Accounts payable, production costing, payroll, BOM, order entry/invoicing, purchase order, estimating/scheduling	IBM PC, 512K bytes with 40M bytes	Some	Both	Job shop	Yes	Yes	Yes	Yes	Yes	Yes	150	\$1,595
ASA International Ltd. (508) 898-2727	Max Manufacturing System	Make-to-order, build-to-stock, \$1 million to \$200 million manufacturers	12	Sales-order processing, inventory and production order control, BOM, MRP, MPS	DEC VAX	All	Both	Both	No	Yes	Yes	Yes	Yes	Yes	120	\$5,000-\$17,500
ASA/Micro-MRP, Inc. (415) 345-6000	Micro-Max MRP	Discrete and repetitive manufacturers	16	BOM, inventory, MRP, purchasing, MPS, SFC	IBM PC, XT, AT and compatibles	NP	Both	NP	No	Yes	Yes	Yes	Yes	Yes	2,200	\$495-\$5,995
Ask Computer Systems, Inc. (415) 969-4442	Manman Information System	Discrete manufacturers	20	Decision maker, general ledger, accounts payable, manufacturing	HP 3000 series, DEC VAX	All	Regeneration	Both	No	Yes	Yes	Yes	No	No	2,000	NP
Axis Computer Systems (508) 481-9600	Axiom	Manufacturers of \$10 million and up	23	Materials, production, cost, order and configuration management, financial	Unisys, Stratus, Sun, Prime	Most	Both	Both	No	Yes	Yes	Yes	Yes	Yes	45	\$7,000-\$15,000
Bluebird Systems (619) 438-2220	Plant Manager	Job shop and discrete manufacturers	15	MRP, SPC, job costing, inventory management, data collection, accounting	IBM PC, AT, PS/2 and compatibles	Most	Regeneration	Job shops	No	No	Yes	Yes	No	No	100	\$500-\$2,000
Bull Hin Formations Systems, Inc. (602) 862-3875	HDMIS Plus	Manufacturers \$10 million to \$100 million	20	MRP, financial, sales order processing, shop-floor feed back, multi warehousing	Honeywell DPS 6, DPS 6 Plus	All	Both	Job shops	No	Yes	Yes	Yes	No	No	25	\$2,200-\$6,600
Bull Manufacturing System HMS/7	Medium discrete manufacturers	7	Inventory record management, MRP, MPS, forecasting, cost accounting, CRP	Honeywell DPS 7000	All	Net change	Job shops	No	No	No	Yes	No	No	63	\$13,700	
Bull Manufacturing System HMS/8	Large discrete manufacturers	9	Inventory record management, manufacturing data control, MPS, MRP, CRP, repetitive manufacturing	Honeywell DPS 8, DPS 88, DPS 90, DPS 8000, DPS 9000	All	Net change	Job shops	No	No	No	Yes	No	Yes	115	\$25,000	
Business Software Development, Inc. (602) 649-1202	The Manufacturer	Small manufacturers, aerospace	3	MRP, aerospace and defense, basic order-driven manufacturing	DEC VAX, IBM PC running Xenix, Unix, CP/M, Novell, 3Com	All	Both	Job shops	No	Yes	No	Yes	Yes	Yes	NP	\$1,995-\$7,995
C. R. Smolin, Inc. (619) 454-3040	E-Z-MRP	Small manufacturers	7	BOM, inventory control, MRP, CRP	IBM PC, XT, AT, PS/2 and compatibles	All	Regeneration	Job shops	No	Yes	No	Yes	Yes	No	100	\$1,295-\$1,995
Caelus, Inc. (509) 455-8566	Caelus Management System	Discrete process, repetitive, JIT manufacturers	22	Production planning, order entry, purchase order management, BOM, SPC, processor, inventory control	Wang VS	All	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	150	\$50,000-\$300,000 per system
Carleton Technologies, Inc. (613) 225-0283	Workware 3000	Heavy equipment, steel manufacturers	10	Accounting, inventory, purchasing, order processing, SPC, MRP	HP 3000LX, 3000GX, 3000XE, 9000 series	All	NP	Both	Yes	Yes	Yes	NP	No	No	NP	\$3,000
Carolina Cipher, Inc. (919) 855-6733	Keyman	Manufacturers of \$1 million and up	13	MRP, standards, BOM, inventory control, sales orders, accounting, purchasing, work-order control	IBM PS/2 Model 80, Data General MV series	All	Both	Both	Yes	Yes	Yes	Yes	Yes	No	11	\$1,200-\$7,000
CD Real Time Systems, Inc. (312) 377-2625	Planned Performance Plus	General manufacturers	13	MRP, CRP, inventory control, standard cost, SPC, accounting	DEC Microvax, VAX	All	Both	Job shops	Yes	Yes	Yes	No	No	No	10	\$4,000-\$10,000
Cinco Systems, Inc. (\$13) 662-2300	Control Manufacturing	Aerospace/defense, electronics, food/beverage, heavy machinery, paper/pulp	16	BOM, MRP, MPS, SPC, cost management, purchasing	DEC VAX; IBM 9370	NP	Both	Job shops	No	No	Yes	Yes	Yes	Yes	200	\$9,000-\$150,000
Compusecure Corp. (714) 879-8800	Dynamic	Manufacturers of under \$15 million	17	MRP, MPS, BOM, routing, CRP, SPC	Data General MV series, IBM PS/2 Models 60 and 80	Most	Both	Job shops	No	No	Yes	Yes	No	Yes	100	\$2,000-\$5,000
Computer Power Group (509) 838-3749	Easy-Pro	Medium to large manufacturers	11	Production control, MRP, sales analysis, general ledger, accounts payable, accounts receivable	IBM RT, hardware running Unix, Xenix, MPE, Primos, Altos, VMS	NP	Regeneration	Process plants	Yes	Yes	Yes	Yes	Yes	Yes	10	NP

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The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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PRODUCT SPOTLIGHT

COMPANY	PRODUCT	TARGET MARKET	TOTAL NUMBER OF MODULES	MAJOR MODULES	HARDWARE REQUIRED	TRANSACTIONS UPDATED IN REAL TIME	NET CHANGE OR REGENERATION LOGIC-BASED	JOB SHOPS OR PROCESS PLANTS	DISTRIBUTION RESOURCE PLANNING	TOOL PLANNING AND SCHEDULING	INTEGRATED ACCOUNTING / FINANCIAL SYSTEM	APPLICATION AND FINANCIAL SYSTEM	RELATIONAL DATABASE MANAGEMENT FEATURES	FOURTH-GENERATION DEVELOPMENT TOOLS	U.S. SITE LICENSEES	PRICE PER MODULE
Computer Solutions, Inc. (617) 229-2200	Growthpower	Discrete manufacturers	20	MRP, BOM, order processing, purchasing, inventory, costing	HP 3000	All	Regeneration	Job shops	No	No	Yes	Yes	Yes	No	550	NP
Computer Systems Development (508) 460-0330	Impcon	Job shops, machinery, metal fabricators, assemble-to-order	8	MRP, financial, SFC, contract costing, time and attendance, make-to-order	DEC Microvax, VAX	All	Regeneration	Job shops	No	Yes	Yes	Yes	Yes	Yes	60	\$12,000-\$150,000 per CPU
Cullinet Software, Inc. (617) 329-7700	Cullinet Manufacturing System	\$100 million manufacturers	8	MRP, BOM, SFC, MPS, inventory, purchasing	IBM 370	All	Net change	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	300	\$75,000-\$150,000
Cycle Computer Corp. (516) 759-3810	CAMS	Manufacturing for inventory, to order, job shops	14	BOM, production control, MRP, job costing, COP, financial	IBM System/36, AS/400, RT	Most	Both	Job shops	Yes	No	Yes	Yes	Yes	No	100	\$1,500-\$4,500
Data 3 Systems, Inc. (707) 528-6580	MRPS 38-S	Manufacturers, process industries	12	Business planning, order entry, CRP, MRP, MPS, SFC	IBM System/38	All	Both	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	200	\$95,000 per package
	SIM/400	Manufacturers, process industries	23	MPS, MRP, general ledger, distributed requirements planning, bar code, inventory	IBM AS/400	All	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	55	\$140,000
	MRPS 38-P Process Planning and Control	Process industries	12	Business planning, MPS, order entry, MRP, product structure, COP	IBM System/38	All	Both	Process plants	Yes	Yes	Yes	Yes	Yes	Yes	25	NP
Datalogix (914) 747-2900	Cimpro	Process manufacturers	20	Formula management, product costing, production planning, inventory control, MPS, MRP	DEC, HP, Unisys systems	Most	Regeneration	Process plants	Yes	Yes	Yes	Yes	No	No	173	NP
Datamation, Inc. (215) 687-4700	Proman	Manufacturers of under \$100 million	7	NP	All hardware running Unix; IBM PC, XT, AT and compatibles, 4300, 3030, 3080, 3090 series	All	Both	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	500	\$10,000
DBSI Information Systems, Inc. (714) 837-3744	Systems for the Manufacturing Company	Make-to-stock or-to-order aerospace, job shops, \$5 million to \$500 million	10	Inventory control, purchasing, production planning and control, MRP, order processing	8935 machines with 2M bytes of RAM and 70M-byte hard drive; DEC VAX	All	Both	Job shops	Yes	Yes	Yes	Yes	Yes	No	137	\$2,500-\$12,500
DeCarlo, Paternite and Associates, Inc. (216) 524-2121	IBS/3000	Repetitive manufacturers	7	Product definition and inventory, manufacturing control, planning, production analysis, purchasing, invoice audit	HP 3000	All	Regeneration	Process plants	Yes	Yes	Yes	Yes	Yes	Yes	50	\$4,375-\$12,500
Diversified Data Systems, Inc. (602) 792-3250	Summit	Large manufacturers	13	Inventory control, forecasting, MRP, BOM, manufacturing order, serial/lot tracking	DEC Microvax II, VAX, Concurrent 3200 series	All	Net change	Job shops	Yes	Yes	Yes	Yes	Yes	No	1	\$35,000 base, \$7,000-\$8,000 optional modules
Dravo Automation Sciences, Inc. (412) 566-3123	Integrated Online Nonstop Manufacturing	Discrete manufacturers	12	CRP, customer-order scheduling, inventory management, order release, SPC, engineering specifications	Tandem Nonstop	All	Net change	Job shops	No	Yes	No	Yes	Yes	Yes	15	NP
Escom, Inc. (206) 828-0995	MMC	General manufacturers	9	Inventory planning, purchasing, SFC, engineering, sales-order and work-order processing	Any hardware supporting Pick	Most	Both	NP	No	Yes	Yes	Yes	Yes	Yes	200	\$1,000-\$20,000
Expandable Software, Inc. (408) 253-7715	Expandable/MRP	Discrete manufacturers	15	Inventory control, BOM, purchasing, job scheduling/comping, MRP, MPS	IBM PC, AT and compatibles, DEC VAX	All	Regeneration	Job shops	No	No	Yes	Yes	Yes	Yes	100	\$2,000-\$7,000
Friedman & Associates (312) 948-7180	The HFA Software Systems	Medium to large manufacturers/distributors	13	Inventory management, engineering records, manufacturing reporting and control, MRP, MPS, CRP, distribution/resource planning, assemble-to-order	IBM AS/400	All	Both	Process plants	Yes	Yes	Yes	Yes	Yes	Yes	85	\$2,400-\$75,000
Fourth Shift Corp. (612) 651-1500	Fourth Shift Manufacturing Software Series	Small to medium manufacturers	23	Inventory control, BOM, MRP II, general ledger, order entry, purchasing	IBM PC, AT, PS/2 and compatibles	All	Both	Process plants	No	Yes	Yes	Yes	Yes	No	NP	\$3,000-\$5,000
Hewlett-Packard Co. (800) 752-0900	HP Manufacturing Management II	Process and discrete/ repetitive manufacturers over \$50 million	16	Materials, production, standard cost and production management; purchasing	HP 3000	Most	Regeneration	Process plants	No	No	Yes	Yes	No	No	1,400	\$3,000-\$100,000
IBM Contact local sales office	AS/400 MAPICS/DB	Small to medium discrete manufacturers	17	Payroll, general ledger, order entry, purchasing, production management, MRP	AS/400	Most	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	NP	\$1,850-\$20,290
	COPICS	Medium to large discrete manufacturers	21	Customer order servicing, MPS, MRP, production, CRP, monitoring and control	IBM 9370, 370 architecture	All	Both	Job shops	No	Yes	No	Yes	Yes	Yes	NP	\$2,740-\$34,720
Imrex Computer Systems, Inc. (516) 486-5210	Imrex Manufacturing System	Repetitive, discrete process manufacturers	6	BOM, SFC, CRP, MRP, MPS, inventory costing, labor management	IBM System/38, AS/400	Most	Both	Job shops	Yes	No	Yes	Yes	Yes	Yes	20	\$15,000-\$20,000
Infary Systems, Inc. (713) 820-5354	Tough Manager	Job shops, custom manufacturers	17	Estimating, job cost, scheduling, routing and tracking, inventory and purchasing	IBM AT, PS/2, RT and compatibles; DEC VAX, Microvax; NCR; Unisys running Unix	Most	Regeneration	Job shops	Yes	Yes	Yes	Yes	No	Yes	350	\$2,000 up
Information Architects, Inc. (312) 577-5325	J-Probes	Small manufacturers of under \$10 million	6	Inventory and production control, BOM, MRP, sales-order process, SFC, job costing	IBM PC, XT, AT, PS/2 and compatibles, RT	All	Net change	Both	No	Yes	No	Yes	No	No	60	\$6,000-\$16,000 per package
	M-Probes	Small manufacturers of under \$10 million	8	Inventory and production control, BOM, MRP, sales-order process, purchasing	IBM PC, XT, AT, PS/2 and compatibles, RT	All	Net change	Both	No	Yes	No	Yes	No	No	60	\$8,000-\$24,000 per package
InfoSource Management, Inc. (919) 782-6229	Jmacs	Job shops	20	Order entry, purchasing, BOM, inventory, MRP, scheduling	IBM PC, XT, AT, PS/2 and compatibles	Most	Both	Job shops	Yes	No	Yes	Yes	No	No	6	\$700
Integral Computer Systems, Inc. (203) 928-0451	CIM + RP	Manufacturers of \$1 million to \$50 million	10	Engineering database, purchasing, inventory, order entry, SFC, data acquisition, CAD interface	IBM PC, XT, AT, PS/2 and compatibles	All	Net change	Job shops	No	Yes	Yes	Yes	Yes	No	5	\$3,000-\$5,000
Interactive Information Systems, Inc. (602) 790-4214	Computer Interactive Integrated Manufacturing	Process, repetitive and discrete manufacturers	14	Inventory, SFC, purchasing, BOM, MRP, MPS	All hardware running Oracle	All	Regeneration	Job shops	No	No	Yes	Yes	Yes	Yes	160	NP

MANUFACTURING TECHNOLOGIES
PRODUCT SPOTLIGHT

COMPANY	PRODUCT	TARGET MARKET	TOTAL NUMBER OF MODULES	MAJOR MODULES	HARDWARE REQUIRED	TRANSACTIONS UPDATED IN REAL TIME	NET CHANGE OR REGENERATION LOGIC-BASED	JOB SHOPS OR PROCESS PLANTS	DISTRIBUTION RESOURCE PLANNING	TOOL PLANNING AND SCHEDULING	INTEGRATED ACCOUNTING / FINANCIAL SYSTEM	APPLICATION AND DBMS INTEGRATION	RELATIONAL DATABASE MANAGEMENT FEATURES	FOURTH-GENERATION DEVELOPMENT TOOLS	U.S. SITE LICENSEES	PRICE PER MODULE
Interactive, Inc. (619) 560-8523	Manufacturer's Infofo	Discrete manufacturers	15	Financial and general accounting, production activity control, sales and service, MRP II, material management	All Pick-based systems	Most	Both	Job shops	No	No	Yes	Yes	Yes	Yes	300	\$50,000-\$250,000 per system
Intertec Diversified Systems, Inc. (415) 326-8900	MAP/3000	Discrete manufacturers	15	Financial accounting, order management, inventory, MRP, manufacturing planning and control	HP 3000	All	Both	Job shops	No	Yes	Yes	Yes	No	No	200	\$3,100
Jobscope (803) 233-1853	Jobscope	Make-to-order manufacturers, service contractors	NA	NA	HP 3000, IBM AS/400	Most	Both	Job shops	No	Yes	Yes	Yes	Yes	No	130	\$50,400
Jonas & Erickson Software Technology, Inc. (201) 863-2900	Apparel Manufacturing and Distribution	Apparel industry	13	Financial, manufacturing, distribution, importers, textile	IBM RT, PS/2; DEC VAX, Microvax; HP Unix	Most	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	1,000	\$15,000-\$250,000 per package
Leiland, Inc. (800) 535-2634	Enhanced System for Traceability and Control	Aerospace and defense manufacturers	16	Procurement, customer order management, inventory, MRP, plant collection and control	IBM 370	All	Both	Both	No	No	Yes	Yes	No	No	2	\$3,500-\$67,500
M&C Systems, Inc. (201) 739-9080	Manufacturing Accounting Production Software	Manufacturers	12	Customer order management, product database, MRP, MPS, CRP, SPC, inventory control	IBM PC, XT, AT, System/34, 36 and 38	Most	Both	Both	Yes	No	Yes	Yes	Yes	Yes	25	\$3,000-\$8,500
M&D Systems, Inc. (716) 662-6611	Myte Myke	General manufacturers	17	Accounting, distribution, bar code, standard cost, production planning and control	All hardware running Unix, SCO Xenix	Most	Both	Process plants	Yes	Yes	Yes	Yes	Yes	No	300	NP
Madic Compufact Corp. (408) 988-8311	Madic	General manufacturers	21	Core manufacturing, human resources, general accounting, distribution, decision support	Prime, Bull HN	All	Regeneration	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	120	\$35,000-\$230,000 per CPU
	Man-Fact II	General manufacturers	23	Base material, vendor and customer management, production planning and control, sales and quotation	Prime; HP; IBM RT	All	Regeneration	NP	Yes	NP	Yes	Yes	Yes	Yes	135	NP
Mandata Systems, Inc. (513) 733-8030	Mandata 2000	Repetitive manufacturers	20	Sales-order processing, MRP, MPS, financial, product data module, SPC	All Pick- and Unix-based systems	All	Both	Process plants	No	No	Yes	Yes	Yes	Yes	100	\$1,000-\$10,000
Manufacturers Support, Inc. (312) 595-2023	Support Series 2	Manufacturers of \$5 million to \$50 million	19	MRP, item master, stock status, automatic work-order launch, scheduling, inventory control	All hardware running Unix	All	Net change	Both	No	Yes	Yes	No	No	No	86	\$3,000
Manufacturing Decision Support Systems, Inc. (216) 861-8100	MDSS	General manufacturers	5	Material control, SPC, job cost, sales and marketing management, labor efficiency, estimating and quoting	HP 3000	All	Both	Both	No	No	Yes	Yes	Yes	Yes	60	\$57,000-\$180,000
	MDSS/ Plastics	Plastics manufacturers	5	Estimating and quoting, customer order, material, financial and labor management	HP 3000	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	10	\$60,000-\$180,000
	MDSS/ Metals	Metal fabricators	5	Estimating and quoting, customer order, material, financial and labor management	HP 3000	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	15	\$60,000-\$180,000
Manufacturing Resource Management, Inc. (414) 792-0400	PACS	Discrete, process, distributive manufacturers	12	Planning data base, MRP, MPS, job costing, COP, SPC	IBM System/38, AS/400	All	Both	Both	Yes	No	Yes	Yes	Yes	Yes	475	\$8,000-\$32,000
Manufacturing Solutions (603) 228-4228	Solutions	Manufacturers of \$2 million to \$50 million	8	Inventory, order entry, MRP, BOM, CAP, SPC	All hardware that can run XM/Cobol	All	Both	Process plants	Yes	Yes	Yes	Yes	Yes	No	100	\$995
Manufacturing Solutions & Systems, Inc. (414) 786-1172	Manufacturing Control System	Small to medium manufacturers	10	Engineering data base, standard product cost, WIP, cost accounting, MRP, purchasing	IBM System/34 and 36, AS/400	All	Regeneration	Both	No	No	No	No	Yes	No	125	\$2,500-\$5,000
Marcam Corp. (617) 965-0220	Prism	Process industries	13	Resource management and processor, planning, production analysis, advanced costing, customer-order management	IBM System/38, AS/400	All	Regeneration	Process plants	No	Yes	Yes	Yes	Yes	No	50	NP
Martek, Inc. (312) 850-7244	AIMS	General manufacturers	5	Production planning, material, financial and sales management; special applications	Hardware independent	All	Regeneration	Job shops	Yes	Yes	Yes	Yes	Yes	No	150	\$2,500 and up
MC Software (916) 756-8104	Inmass II	General manufacturers	12	Inventory control, MRP, BOM, job cost/WIP, purchasing, order entry	IBM PC, XT, AT, PS/2 and compatibles	Most	Regeneration	Job shops	No	Yes	Yes	Yes	No	No	2,100	\$995-\$1,495 per package
MCBA, Inc. (818) 242-9600	MCBA Classic Manufacturing Software	Job shops, discrete manufacturers	18	SFC, job costing, MRP, inventory management, MPS, CRP	DEC VAX; HP 3000; Wang VS; Unix and Xerox-based machines	Most	Regeneration	Job shops	No	Yes	Yes	Yes	No	No	1,000	\$1,000-\$16,000
Metasystems, Inc. (216) 561-9111	Interactive Computer Integrated Manufacturing	Distributors, manufacturers	14	MRP, job costing, BOM, financials, order processing, sales history	All hardware running Oracle	All	Regeneration	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	20	\$2,000-\$10,000
Microware Corp. (214) 985-1740	Microware Manufacturing	Small manufacturers	16	Inventory, BOM, order processing, product costing, forecasting, CRP, MRP	IBM PC, XT, PS/2	All	Both	Both	Yes	Yes	Yes	Yes	No	No	200	\$195-\$695
Mini Business Systems, Inc. (203) 426-4787	Profit's Business Series	Manufacturers, distributors, equipment rental firms	15	Order processing, inventory control, purchase order, work order, BOM, accounts receivable	IBM PC, AT or compatible; systems running Unix, Pick	All	Both	Process plants	Yes	Yes	Yes	Yes	Yes	Yes	450	\$995-\$6,000
Minx Software, Inc. (408) 453-6469	Minx Information System	Discrete manufacturers	23	Inventory, BOM, MRP II, accounts payable and receivable, purchasing	All Unix Systems V-based hardware	All	Both	Both	No	Yes	Yes	Yes	No	No	50	NP
MMS International (614) 895-0738	Syman	Make-to-stock, make-to-order, combination manufacturers	14	MRP, SPC, inventory control, order entry, purchasing, payroll	HP 9000 series, Unisys 5000, 6000 series, NCR Tower, Prime EXL316, Altos 1000, 2000 series, DEC VAX	All	Both	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	425	NP
MSA Advanced Manufacturing, Inc. (404) 239-2000	AMAPS	\$50 million and up manufacturers	26	Financial, human resources, logistics, sales and operations, planning, manufacturing, factory control and management	IBM 3030, 3080, 3090, 4300 series; HP 3000, 9000	Most	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	20,000	NP
Norampac Software, (416) 831-1998	NST-MRP2	Large manufacturers	9	Inventory, MPS, CRP, BOM, work orders	IBM mainframes running CICS	All	Regeneration	Job shops	Yes	No	No	Yes	No	No	2 Canadian	\$60,000
Northeast Data Systems, Inc. (617) 273-2920	Intrepid MMS	Machinery, equipment, instruments, high-tech electronics	23	Quotations/estimating, COP, MPS, MRP, SPC, job tracking	Prime series 50, EXL, Pick- and Unix-based systems	All	Both	Job shops	No	No	Yes	Yes	Yes	Yes	125	\$3,000-\$22,500

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MANUFACTURING TECHNOLOGIES
PRODUCT SPOTLIGHT

COMPANY	PRODUCT	TARGET MARKET	TOTAL NUMBER OF MODULES	MAJOR MODULES	HARDWARE REQUIRED	TRANSACTIONS UPDATED IN REAL TIME	NET CHANGE OR REGENERATION LOGIC-BASED	JOB SHOPS OR PROCESS PLANTS	DISTRIBUTION RESOURCE PLANNING	TOOL PLANNING AND SCHEDULING	INTEGRATED ACCOUNTING/ FINANCIAL SYSTEM	APPLICATION AND DBMS INTEGRATION	RELATIONAL DATABASE MANAGEMENT FEATURES	FOURTH-GENERATION DEVELOPMENT TOOLS	U.S. SITE LICENSEES	PRICE PER MODULE
On-Line Software Laboratories, Inc. (714) 680-0602	DMACS	Manufacturers, distributors	20	Costing, inventory, purchasing, requirements planning, WIP, manufacturing/ engineering	Unisys A series, Unix-based systems	All	Both	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	35	\$13,000
Pilot Systems, Inc. (414) 792-0050	Pilot Job Shop Software	Order-driven manufacturers	10	Accounting, engineering/quoting, manufacturing planning, engineering, control and costing	IBM and HP systems running Unix	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	1,200	\$40,000 per package
Prinetrack, Inc. (203) 651-9756	Integrated Manufacturing Systems	Custom-build manufacturers	12	Order processing, BOM, inventory purchasing, job costing, production planning	IBM PC, XT, AT, PS/2 and compatibles	All	Net change	Job shops	No	Yes	Yes	Yes	Yes	Yes	150	\$1,500-\$4,000
Pro:Man (206) 451-0404	Pro:Man	Small to medium manufacturers	18	CRP, costing, MRP, MPS, SFC, sales order and processing	IBM PC, AT, RT, 4300 series; ADDS; DEC VAX, Microway; Altos, Stratus	All	Both	Both	No	Yes	Yes	Yes	Yes	Yes	300	\$8,000 plus \$1,000 per user
Profitkey International (603) 898-9800	Profitkey Custom Manufacturing System	Discrete medium manufacturers	24	Job definition and inquiry, SFC, product engineering, job scheduling, order entry and shipping, materials planning	Hardware running Unix, Xenix, VMS, AIX	All	Both	Job shops	No	Yes	Yes	Yes	No	No	600	\$15,000-\$100,000
	Profitkey Job Shop System	Discrete medium manufacturers	24	Job definition and inquiry, SFC, inventory control, job scheduling, order entry and shipping, estimating	Hardware running Unix, Xenix, VMS, AIX	All	Both	Job shops	No	Yes	Yes	Yes	No	No	600	\$15,000-\$100,000
	Profitkey Traditional Manufacturing System	Discrete medium manufacturers	24	MPS, regenerative MRP, SFC, statistical forecasting, capacity scheduling, order entry and shipping	Hardware running Unix, Xenix, VMS, AIX	All	Both	Job shops	No	Yes	Yes	Yes	No	No	600	\$15,000-\$100,000
Prologic Management Systems, Inc. (602) 741-1001	MESA	Repetitive manufacturers, job shops	16	MRP, SFC, standard product routing, job costing, inventory management, BOM	DOS, Unix, Xenix-based micros; IBM RT	Most	Regeneration	Both	Yes	Yes	Yes	No	No	No	100	\$1,295-\$1,795
Qad, Inc. (805) 684-6614	MFG/Pro	Discrete manufacturers, make-to-stock, assemble-to-order, repetitive job shops and distributors	26	Engineering, work orders, MRP, MPS, CRP, accounting	IBM PC, XT, AT, PS/2 and compatibles; RT; DEC Microway, VAX; all system environments, Unix, Xenix, Ultra, VMS	All	Both	Both	No	Yes	Yes	Yes	Yes	Yes	100	NP
Quantel Business Systems, Inc. (415) 887-7777	Q M-R-P	General manufacturers	12	Distribution, accounting, manufacturing, planning, database	IBM PC, AT and compatibles; Quantel	NP	Both	Job shops	No	Yes	Yes	No	No	No	600	\$3,500-\$50,000 per package
Quonics Technology, Inc. (408) 982-8700	CIM Plant Manager	Metal, textile, pulp/paper, food/beverage, chemical, semi-conductor industries	5	Area planning, automatic scheduling, production tracking, inventory management, manufacturing data collection	IBM System/36; Stratus XA2000	All	Net change	Process plants	No	Yes	Yes	Yes	Yes	Yes	16	\$30,000 and up
Relevant Business Systems, Inc. (415) 867-3830	Infimacs	Discrete manufacturers, \$5 million to over \$100 million	21	MPS, capacity planning, purchasing, MRP, SFC, inventory control	DEC Microway, VAX; IBM PC, XT, AT, PS/2 and compatibles, RT, AS/400	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	50	\$2,500-\$6,500
Software PM, Inc. (414) 545-1414	Manufacturing PM	Manufacturers of \$1 million to \$25 million	14	Accounting, customer-order management, MRP, product data base, purchasing, SFC	IBM System/38, AS/400, PS/2	Most	Both	Job shops	No	Yes	Yes	Yes	Yes	No	350	NP
Solid State Software, Inc. (816) 637-8638	Impac	General manufacturers	13	Inventory control, BOM, MRP, MPS, CRP	All hardware running Unix, Xenix	All	Both	Both	No	Yes	Yes	Yes	No	No	200	\$3,000
SSA, Inc. (312) 641-2900	BPCS-Business Planning & Control Systems	Small to medium manufacturers	25	Inventory management, distribution resource planning, MRP II, SFC, JIT performance measurement	IBM AS/400, System/36 and 38	All	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	2,000	NP
STSC, Inc. (301) 984-5000	MRP Plus	Process, repetitive manufacturers	5	Master scheduling, MRP, CRP, distribution resource planning	IBM 370	Most	Both	Process plant	Yes	Yes	No	Yes	Yes	No	25	NP
Suny Systems, Inc. (201) 480-8868	Sunymp	Health care, manufacturers, distributors	13	Inventory, SFC, costing, purchase order process, BOM	IBM PC, XT, AT, PS/2 and compatibles	All	Both	Both	No	Yes	Yes	Yes	No	Yes	100	\$5,000-\$15,000
System Dynamics Corp. (416) 475-5155	Dynamic Manufacturing	Small to medium manufacturers	11	BOM, production control, cost control, CRP, IJ, duration planning, purchasing	80386-based systems	Most	Both	Both	Yes	Yes	Yes	Yes	Yes	Yes	0	\$4,995 per package
Systems for Profit, Inc. (414) 327-7560	CMI Profit	Manufacturers of \$1 million to \$10 million	15	Inventory control, sales-order entry, work-order entry and history, MRP, MPS, CRP	All hardware running Unix, Xenix	All	Both	Job shops	Yes	Yes	Yes	No	No	Yes	1,300	\$180-\$3,000
Teamco Systems Innovation, Inc. (617) 933-6545	MFG II ACC II	Fortune 1,000 discrete manufacturers	18	Materials management, SFC, MRP, CRP, general ledger, accounts payable, accounts receivable	IBM 4300 series, 3030, 3080, 3090, 9300 series	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	32	NP
Telet Corp. (312) 571-8111	TMS	General manufacturers, distributors	28	MRP, CRP, work-order release, SFC, shipping and traffic	Prince Series 50, EXL; IBM PC, XT, AT and compatibles	All	Both	Job shops	Yes	Yes	Yes	Yes	Yes	Yes	25	\$25,000
Tomark-Cyber Associates, Inc. (516) 759-5810	Profit	Metal, plastics, durable products	15	Production control, BOM, MRP, costing, order processing, financial	Multitimer IBM AT, PS/2, RT running Unix	Most	Both	Job shops	Yes	No	Yes	Yes	Yes	No	500	\$1,000-\$3,000
Unics Corp. (316) 543-5387	Unics 1100	Fortune 1,000 manufacturers	NP	Sales-order management, planning and scheduling, product costing, SPC, MRP	Unics 1100, 2200 series	All	Both	Job shops	Yes	No	Yes	Yes	No	No	100	\$2,500
	Sierra	Fortune 1,000 manufacturers	21	MRP, MPS; purchasing, planning, operations and financial management	Unics A Series	Most	Both	Job shops	Yes	No	Yes	Yes	Yes	No	100	\$4,000-\$12,000
Unifrontis Corp. (201) 981-6600	Praza	Manufacturers and distributors	20	Sales/marketing, synchronized manufacturing, MRP, financial/accounting	DEC VAX, Microway	All	Regeneration	Both	No	Yes	Yes	No	Yes	Yes	400	NP
Uneware International (813) 745-5000	Pioneer Command	Discrete manufacturers, distributors, assemblers	13	Inventory, production control, job cost, MRP, MPS	DEC PDP, VAX	All	Both	Job shops	Yes	No	Yes	Yes	No	Yes	6	\$1,500-\$30,000
Western Data Systems (813) 340-4041	Compass Contract	Aerospace/defense manufacturers	13	Contract and engineering configuration management, cost accounting, SPC, MPS, CRP	IBM 4300, 9370, 3630, 3080, 3090; HP 3000, Spectrum; DEC VAX	All	Both	Job shops	No	Yes	Yes	Yes	Yes	Yes	125	\$125,000-\$600,000
Louis A. Wright & Associates, Inc. (313) 458-7760	AMPS	Automotive suppliers, manufacturers	15	Release accounting, repetitive manufacturing, purchasing, sales reporting, vendor releasing	IBM AS/400, System/36, System/38, release accounting only	Most	Regeneration	NP	No	Yes	Yes	Yes	No	No	130	\$1,500-\$60,000
	Access	Job shops, custom contract manufacturers	11	Job cost, resource scheduling, purchasing, order entry, BOM, MRP	IBM System/36, AS/400	Most	Regeneration	Job shops	No	No	Yes	Yes	No	No	40	\$2,000-\$15,000
Xerox Computer Services (213) 306-4000	Xerox Business Management System	Medium discrete and repetitive manufacturers	16	Inventory, MRP, purchasing, cost planning and control, repetitive manufacturing, general ledger	IBM 370	All	Regeneration	Job shops	No	No	Yes	Yes	No	Yes	200	\$110,000 per package

IN DEPTH

Nightmare on Wall Street

Green PC users can wreak havoc on intercompany financial reporting

BY JESSICA KEYES

What is beige and white — or grey and white — and invokes terror in the hearts of innocents everywhere? Got it yet? Sometimes it is thought of as a \$7,000 paperweight, collecting dust in some corner, perched atop the thousands of pages of manuals and documentation that came with it. Any closer? And what is that dent in the wall with fragments of plastic scattered all over the floor just below? While sifting through the debris, you come across a burnt-edge scrap of paper. Wait a minute... Holding it up to the light, you can just make out what it says: "CANNOTOPENCOM2."

Keyes is managing director of the technology and product development group at a major Wall Street financial organization.

One unexpected problem facing today's business world — and its information systems managers — is represented by an equation that has not been adequately balanced: Naive personal computer users (not your average business-school graduates with microcomputers as extensions of their wrists) paired with the need to use the PC in some reporting capacity. The equation becomes trickier when the reporting is made outside of the company.

Yet, there are millions of PCs out there in thousands of companies — someone must be doing something with them; obviously there must be people who understand how to use them. Of course there are. There is Joe, the computer jock, who loves getting into the bits and bytes. Then there's Mary, the hacker, who loves getting into people's files. And how about Len, the information center spe-

cialist? His goal in life is to train the masses on Lotus 1-2-3 and Wordperfect.

But then there's Gary, a naive end user in the accounting department of a brokerage firm, who is faced with a new requirement to enter and transmit data to the tax man, the main office, the Securities and Exchange Commission and the various and sundry regulatory agencies that monitor the marketplace.

Information hogs

Financial institutions hoard data. In the course of selling thousands of securities to millions of customers, the business of doing business becomes extremely paper-intensive. And the business of reporting on this highly regulated industry constitutes a veritable paper shock, from financial statements, loan agreements and complaints to stock information and customer statements.

But to the hapless souls who

need this mountain of reporting data, the deluge is never-ending and usually keypunched with less than complete accuracy, forcing the back-office staff to verify, verify and verify again until the data is 100% clean and accurate.

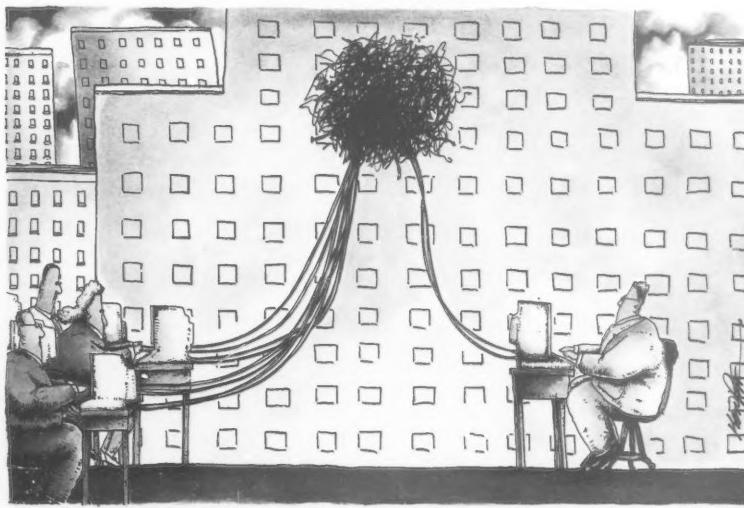
It is at this point that multi-million-dollar, complex information systems take over to analyze the data, looking for potential financial or operational problems, monitoring trends that could lead to problems or even forecasting future problems. So on one end you have these expensive, souped-up systems choked at the other end by endless streams of paper and a burdensome keypunch operation.

May I introduce the PC?

Enter the microcomputer. Brilliance strikes an organization only a very few times, and in the case of deciding to use the microcomputer to transmit required data, it is still unclear whether this was brilliance or sheer luck. Whatever it was, it is a lot harder than it looks.

The firms on Wall Street are as different from one another as they are similar. From the large, technically sophisticated firms to the small Mom-and-Pop companies with no computers, a micro-computing reporting requirement compounds the problem in proportion to the number of firms transmitting information. And for every Joe, Mary or Len working in the real world, there are 10 Garies.

Unfortunately, transmission of data to regulators and other destinations is generally delegated to the lowest rung on the employee hierarchy ladder — in other words, whoever is available. To make matters worse, many of these transmissions are not made daily, but rather monthly or quarterly. Infrequent

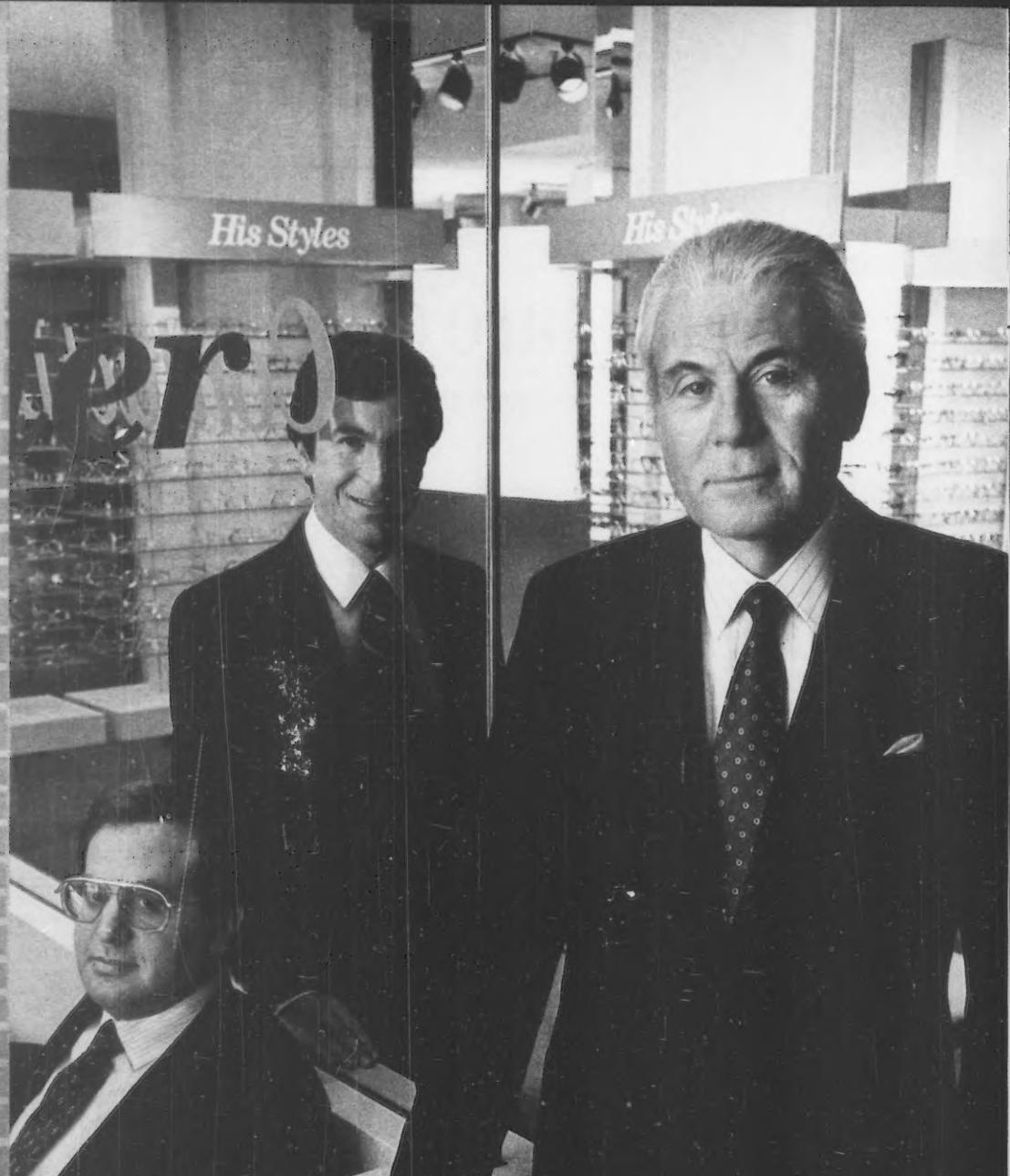


KEVIN POPE

• "What's a modem?"

• Relief found at high end of learning curve

• It's harder than it sounds



Sterling Optical needed
a computer company
with exceptional vision.

Left to Right
Daron Kahn,
Executive Vice President, Sterling Optical

Richard Letourneau,
AT&T Data Sales Executive

Robert S. Savin,
Chairman and CEO, IPCO Corporation
President, Sterling Optical Division

Chesterfield, Missouri
February 28, 1989

Sterling Optical, one of the leading optical chains in the country, was looking for a way to get a jump on their competitors in the retail eyeglass and eyecare marketplace. Sterling Optical's Bob Savin, Daron Kahn and AT&T's Rich Letourneau discuss how AT&T developed an open systems-based, retail point-of-sale system to network their 250 stores nationwide.

Sterling: We were getting frustrated by the delays we were facing with the old way of doing things. Our customers were unhappy, we were unhappy, and headquarters wasn't able to keep up with the volume of requests. We knew a highly integrated distributed networked computing solution was the only way to go.

AT&T: And you wanted to preserve the investments you'd already made in applications software—especially those on the System/38.

Sterling: Absolutely. All our RPG-coded customer records and our inventory control system are stored in the database at headquarters. The retail business is demanding—you can't afford to wait to implement brand-new technology. Plus, we don't have a very large computer programming department, and in order to develop, modify, or change corporate programs on the System/38, it's a big effort, and it takes a lot of time.

AT&T: That's why we built our multiuser platform based on the UNIX® System V operating system. We gave you the tools to develop new applications and get them into the mainstream of your business quickly.

Sterling: It made sense. We were able to keep our hardware and software *and* install AT&T 6386 WorkGroup Systems in our stores. Now, on a daily basis, we know what's selling and what's not. We even included an employee time and attendance system that feeds into our existing payroll system.

AT&T: And you've kept your system options open. You can modify any part of the

system at any time. Like when you added the automatic pricing software.

Sterling: Right. I think what we like most about the system is its simplicity. Despite the complexity of the information handled, it really gives us easy access to our information. We need that to improve the profit potential of our business, and to maintain our lead in the industry.

AT&T: The system also provides investment protection for what you have today, and a gradual growth path to what you'll need tomorrow.

Sterling: One of the most striking things was AT&T's commitment to service. We came from an environment where it wasn't uncommon to be down for two to three or four days, waiting for equipment to be shipped or repaired.

AT&T: Our message was simple: AT&T wants your business.

Sterling: You were here working as much as we were. And you really listened to us. Of all the vendors we spoke to, you gave us the best proposal, the best equipment, and the best price. In fact, we're so excited about the new system, we wrote it up in our company newsletter.

AT&T: I heard! Can we get a copy?

Sterling: Sure.

The only catch is, you have to read it from across the room with one eye closed.

The Sterling Optical Computer Solution:

THE CHALLENGE

Create a point-of-sale computer system specific to the optical retail business for the 250-store nationwide Sterling Optical chain.

THE SOLUTION

AT&T created a UNIX System V-based network of AT&T 6386 WorkGroup Systems and AT&T 605 terminals chain-wide. At headquarters, an AT&T 3B2/500 gathers orders and information from each store daily. The system allows a smooth link between the 3B2/500 computer and the existing IBM System/38. A custom INFORMIX database management system forms the heart of the applications software.

THE RESULT

Sterling Optical customers are getting better service. All store locations will be using one standard point-of-sale system that provides increased productivity, a friendlier working environment, and greatly enhances Sterling Optical's competitive ness in the industry.

Call your AT&T Account Executive, AT&T Authorized Reseller or 1 800 247-1212, Ext. 550.

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INFORMIX is a registered trademark of Informix Software Inc. UNIX is a registered trademark of AT&T in the U.S. and other countries. ©1989 AT&T



transmissions mean a continuous stream of users on the lowest end of the learning curve. And dealing with the bottom of the learning curve means increasing levels of support costing cold, hard dollars.

Horror stories

At one firm, a clerk named Peggy called the Help desk at her data's destination to complain that the data was not transmitting. She had entered it successfully, and it had passed all edit checks, she said. She ran the transmission program, which she had run a thousand times before, but got no message from the host indicating that the Send was successful. Pat, a member of the Help desk staff, asked Peggy if her modem was working properly. "What modem?" Peggy asked. "You know, that little white box that is sitting right next to your PC." Pat answered. "Oh, yeah. It's not there." A simple problem — a missing modem — but time is still spent trying to resolve the difficulty.

Then there is the story of the no-name computer. When a new application is targeted for PC transmission, some firms send out a questionnaire to be completed by a technical staffer at the transmitting company. A typical questionnaire asks for such mundane information as brand of PC, model number, type of modem used, whether a hard disk is available and so on. These questions are asked so that the data-entry and transmission diskettes can be configured appropriately.

Getting accurate answers to these questions can be surprisingly difficult. It often turns out that the PC described in the questionnaire bears no resemblance to the machine actually used for transmission. To be on the safe side, each of the firms is often called personally to confirm the information on the questionnaire. At one transmitting firm, the person at the other end of the phone vehemently insisted that their computer was not an IBM, not a Leading Edge, not a Compaq, but a Computerland. Did you know about Computerland's brand of PC?

Help desks breathe numerous sighs of relief when a user firm has finally achieved that pinnacle of success, the high end of the learning curve. But too often despair soon follows when Charlie from XYZ firm quits. This happened to one New York regulator recently when one of its subscriber firms moved across the river to New Jersey. At 4 p.m. on the day before the required transmission, the regulator got a call from Peter, Charlie's replacement, who requested that someone sail across the Hudson to train him in the intricacies of automated regulatory reporting. All in a day's work.

Life gets complicated

At the same regulatory agency, life did indeed get complicated when it decided that PC transmission was a good idea for the many diverse manual reports it receives. In the reports, file layouts are all different, the volumes of data transmitted are all very different, and obviously the user base is very, very different. Each application uses a unique data-entry application geared specifically for the data coming in. Screen layouts and data edits are written to ensure ease-of-use for the user and cleanliness of data. But data entry is the easy part; the hard part is forcing the data across the network.

For those who run these large networks, the big question is whether to buy or build a transmission program. There are many software packages that permit

THERE ARE MANY software packages that permit files to be sent from one location to another. Unfortunately, they are less than straightforward to use. Add to this complexity the average experience level of the users, and you have a potential bottleneck.

files to be sent from one location to another. Unfortunately, they are less than straightforward to use. Add to this complexity the average experience level of the users, and you have a potential bottleneck.

Fortunately, there are programs on the marketplace today that can be used to build a shell around the complex transmis-

sion program and reduce the complexity to a manageable level. Added to the ability to provide a facile look and feel to the transmission program, these scripting languages can reduce the number of keystrokes by automatically dialing the receiving computer and initiating the Send of the data to be transmitted, automate log-on to a remote computer and receive

acceptance of a message that the data was received by the host.

Many of the large firms that are faced with the onerous requirement of automated regulatory reporting and who have extensive computer capabilities opt for CPU-to-CPU transmission, which is much easier to manage. The firms that utilize the PC-based products tend to be small firms or firms that do not want to tap their expensive data processing department resources to write programs and procedures to send their data CPU-to-CPU.

The roads not taken

Given the bleak description just painted, you may wonder why other avenues of data capture are not being used on the Street. In fact, the routes to data capture

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are numerous and have been traversed by many. From the smallest brokerage firm to the government's Securities and Exchange Commission, everyone has been looking for answers.

The SEC has researched data capture and created a prototype along these lines, which is now taking flight in development. The prototype is a vehicle for the transmission of automated filings to the SEC. In the same vein, other Wall Street firms have gotten on the bandwagon to research ways other than data entry.

One of the earlier forays into alternatives to data entry was scanning, an excellent idea in theory but a dud in practice. The scanners worked perfectly, but the regulatory forms did not. The prototype form contained hundreds of items of information all packed together in a data entry clerk's nightmare.

Scanner would read as a "B" a "3" that was typed much too close to the edge of a box. Clearly, regulatory forms and scanners did not mix, so the agency moved on to other experiments.

Print carefully

One of the more humorous adventures of one Wall Street firm was in the area of handwritten input. The firm searched high and low for a reliable handwriting reader. The research group, which consisted of all dyed-in-the-wool techies, diligently tested the chosen device. They filled out countless forms, which were accepted with a 100% accuracy rate by the scanner. These were the type of forms that forced the user to write each letter in a rectangle with a dot in the middle. You had to artfully maneuver your pen to loop around the dot when making letters such as a "B" or a number such as "8."

However, the real test was with a group of auditors. Approximately 10 auditors were requested to fill out these forms. The trouble was that these folks speedily filled out the forms, disregarding the little dot in the middle, as normal people are wont to do. All forms were rejected and so was the scanner.

Which leads to the present. Why PC transmission? The firms that do this have carefully measured the cost of the only other remaining, seemly viable alterna-

tive, which was to hook up thousands of firms to a real-time transaction-oriented network such as IBM's CICS. Each firm would use a dumb terminal, controller and leased telephone line. But this last resort was prohibitively expensive, so the idea was junked and PC reporting was born.

No big deal?

Now the uninitiated might say that this data transmission notion seems like a simple problem. But as many black-bags-under-the-eyes Help and IS staff people will attest, it isn't.

When you mix many applications, requiring transmission of thousands of bytes of information, by hundreds of different firms, by hundreds of different people with varying levels of expertise — a monster is created.

But the uninitiated will counter that the banks have been doing this for years with home banking. They have, but they have one product, one set of users and few bytes of data are actually transmitted.

FOR THE novice, the ultimate PC reporting product would include an easy-to-use icon-based program permitting access to the appropriate data entry program with a flick of the wrist.

Have you heard that Chemical Bank has gone out of the home-banking business? It found that the average person just does not want to bother with all of the vagaries of telephone lines, modems and associated paraphernalia.

For the novice, the ultimate PC reporting product would include an easy-to-use icon-based program permitting access to the appropriate data entry program with a flick of the wrist. The same icon menu would be used to access the transmission program. Icon-based technology is preferable as it clearly indicates to the users the options available and makes moving among these choices very easy.

There are three keys to a successful program and they are support, support and more support.

A comprehensive support setup includes the following: an 800 number at which the phone is answered immediately and answers to questions are quickly attained; remote troubleshooting in which a Help desk staff member can tap into a user's computer to monitor the run and diagnose problems; automatic downloading of new releases of software via a bulletin board feature; electronic mail for communications between the sending and receiving firms; a network with 100% uptime; professionally prepared documentation; and, most important, user training.

These are the elements of success, and many Wall Street financial organizations have gone off in search of it. Their travels are taking them both to outside vendors, such as GE Information Services and Quotron Systems, Inc., and to the firms' own internal IS groups.

Hopefully the quest for an acceptable PC solution to the problem of data entry and transmission will be successful, making our evenings on Wall Street something less than a nightmare in the near future. *



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INTERGRAPH

TPX® Application Integration Made Easy

Consolidated Customer Information/History System

Customer Information System Name: Steven A. Crilley Address: 3217 Moondale Drive Freeport, PA. 15116 Account Type: Pay-by-Phone Account Number: 744-7115-2334 Account Type Account Number Pay-by-Phone 744-7115-2334 Date Amount Number Description 12/01/88 15.75 100 Timar Oil Company 12/03/88 121.64 101 A.B.C. Gas Company 12/04/88 325.00 102 Fax Stores	Account Type: Pay-by-Phone Customer Name: Steven A. Crilley Address: 3217 Moondale Drive Freeport, PA. 15116 Account Number: 744-7115-2334 Date Amount Number Description 12/01/88 15.75 100 Timar Oil Company 12/03/88 121.64 101 A.B.C. Gas Company 12/04/88 325.00 102 Fax Stores Enter next account number ==> 744-7115-2334 Press PF-1 for Help	Pay-by-Phone Statement for Account: 744-7115-2334 Date Amount Number Description 12/01/88 15.75 100 Timar Oil Company 12/03/88 121.64 101 A.B.C. Gas Company 12/04/88 325.00 102 Fax Stores
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TPX Version 2.0—the New Standard in Session Management

Session managers allow users to switch among applications, but what happens when information is needed from two or more applications at the same time? TPX, the world's leading session manager, now sets a new standard for session management by providing Application Integration—easily.

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TPX Provides the Solution

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COMPUTER INDUSTRY

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All mergers are not created equal



"God didn't create quarterly reporting," a software company's chief executive officer reminded me recently. "Nobody came down from the mountain and said, 'Let there be a Securities and Exchange Commission.'" It's an easy point to forget; thanks, John. And while we're at it, here's another one that tends to get by us: God didn't create acquisitions, either — and even if he did, he sure didn't create them equal.

The tidal wave of mergers and acquisitions breaking over the computer industry of late is so staggering, and the questions raised by the sheer number of combinations are so compelling, that we can easily lose sight of the particulars amid awe of the general.

The danger in assuming that there's such a beast as The Generic Acquisition can be seen in the contrast between two take-over bids currently getting a lot of same-breath mention — partly because they're two of the bigger stunners in the industry and partly because of the impact their respective big-ticket prices could have on computer company valuations in the near future. When you've gasped out that long sentence, you're just about exhausted the list of what these deals have in common.

I'm referring, of course, to MAI Basic Four's bid of approximately \$970 million for Prime Computer and Hewlett-Packard's \$475 million offer to buy Apollo Computer — the deal you love to hate, and the deal you have to love.

On Tin Pan Alley, according to George M. Cohan, the "name to which shame never has been connected" is Harrigan. In Silicon Valley, it's HP. Not just in the computer industry but in the annals of U.S. entrepreneurial business, HP has enjoyed a long run as a must-include every time a survey hound sniffs out the 100 best places to work, the 50 best-managed firms or

Continued on page 86

Lone Star smarts

Texas graphics firm hits pay dirt with CAEX

BY ALAN J. RYAN
CW STAFF

HOUSTON — Gone are the days when a shotgun-toting hillbilly with lousy aim could accidentally shoot the ground and strike it rich in the oil business.

Finding oil used to be almost that easy. Now, nearly all of the readily accessed oil and natural gas has been depleted, and the oil industry is exploring ways to find more remote fields — often deep beneath the planet's oceans — and more efficient ways to develop petroleum reserves.

Landmark Graphics Corp. is one firm in a burgeoning field of competitors that is capitalizing on the need for efficient and quick analysis of seismic data through use of computer-aided exploration (CAEX) technology.

The early 1960s saw a revolution in the ability to find oil and gas when the analog method of seismic data collection was replaced by the digital method. Today, collection remains the same, but the way data is analyzed is encountering a revolution of its own.

Landmark Graphics "has

Up & Coming: Landmark Graphics



Headquarters: Houston
Founded: 1982

Chairman: C. E. (Gene) Ennis

First product shipped: 1984

First profitable month: December 1984

Goal: To place hardware and software computing power at the oil explorationist's fingertips

been successful because the people who founded the company grew up in the [oil] industry," said Richard D. Schwarz, first vice-president of the equity research department at Shearson

Lehman Hutton, Inc. "They knew the needs of the people doing the application very well."

The company was founded in 1982 by three entrepreneurs
Continued on page 84

Stratus pockets Pacific Rim profit

BY ROBERT MORAN
CW STAFF

Selling a computer is selling a computer, regardless of the country, its culture or its language. But from 1987 to 1988, Stratus Computer, Inc. more

than doubled its business throughout the Pacific Rim. It expects the same performance in 1989 and beyond.

The manufacturer of fault-tolerant computers, based in Marlboro, Mass., tapped the Pacific Rim for \$20 million in reve-

nue last year and expects to ship about \$45 million next year, said Paul Bergeron, the company's Asia Pacific area director.

Bergeron expects the company to maintain that rate of growth until it achieves about \$100 million in 1990. "We expect a more rapid growth rate in the Asian Pacific than the other parts of the world for the next few years," Bergeron said. "But those quantum leaps are difficult to maintain and will slow down."

The firm as a whole boasts about a 40% annual growth rate, reporting sales of \$265.3 million worldwide in 1988. Bergeron said that the Pacific Rim operation will have a growth rate of approximately 60% three or four years from now.

nels and the robust economy of Pacific Rim countries. Stratus allies IBM and Ing. C. Olivetti & Co. generated about half the business for the company, with the majority of that coming from IBM sales of Stratus hardware into Japan's banking business. IBM's presence in the marketplace and relationships with software vendors has added significant value, he said.

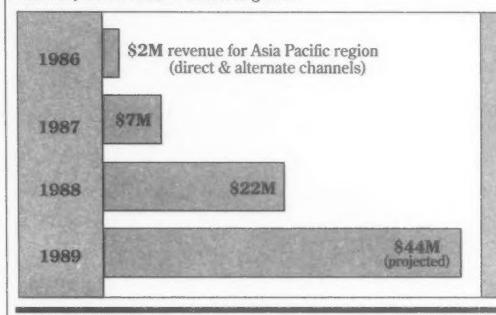
Bergeron said that in Japan, Stratus is quickly closing the gap between its own sales and that of its considerably larger archcompetitor, Tandem Computers, Inc. "In 1990, we will be almost their size," he said.

In addition to its relationship with IBM, Stratus sells its com-

Continued on page 85

And so it grows

Stratus' Asia Pacific region revenue shows gains even more impressive than the firm's overall 40% annual growth



SOURCE: STRATUS COMPUTER, INC.

CW CHART: DOREEN DAHLK

Navy sinks contested IBM hardware procurement deal

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A systems integrator that accused the U.S. Navy of a pro-IBM bias won a small battle earlier this month when the Navy agreed to cancel a \$12 million procurement that seemed earmarked for IBM hardware.

The settlement came after Pacificorp Capital, Inc., a systems integrator in Reston, Va., filed a formal protest over a

specification that bundled IBM 3480 tape cartridge systems with an IBM 3380-BK4 disk drive — which can only be supplied by IBM.

The cartridge tape subsystems are available from three other IBM-compatible system suppliers, Pacificorp noted, suggesting that the procurement should have been broken up to promote competition.

Similar complaints by a coalition of IBM-compatible vendors, including Pacificorp, Amdahl

Corp. and Storage Technology Corp., have led to a congressional investigation of charges that the Navy is biased toward IBM [CW, Feb. 13]. Federal agencies are required to allow full and open competition for computer contracts.

Too cozy?

In this case, Pacificorp charged that the intended customer, the Navy Postgraduate School in California, had developed an especially close relationship with IBM.

Pacificorp released an internal Navy memo — accidentally faxed to Pacificorp's attorneys — in which a Navy attorney wrote that he believed "that we

would now lose on the bias charge."

The Navy memorandum suggested that the Navy specifications so closely matched the IBM gear that "it shows bias, or at least the lack of a functioning brain."

Under the settlement, the sole solicitation is canceled, and any follow-on procurement must be cleared by a special Navy review board, which was created last month.

The review board is chaired by Rear Adm. Paul Tobin, the Navy's director of information resources management, and Rear Adm. William H. Haunstein, the Navy's competition advocate general.

CSC creates commercial group

BY AMY CORTESE
CW STAFF

Computer Sciences Corp. (CSC), the professional services giant that has served the federal government for more than two decades, signaled a serious move

into the commercial sector last week with the creation of the Commercial Systems Group (CSG).

The new division will compete head-on with the likes of Andersen Consulting and Electronic Data Systems Corp. in the

lucrative business of providing systems integration services to corporations worldwide.

Thomas Gerrity, founder and chairman of the Index Group, Inc., a Cambridge, Mass.-based corporate consulting firm acquired by CSC last fall, was

named president of the new division.

Commercial Systems combines the Index Group; CSC Partners, Inc., a systems development and integration firm acquired in 1986; software developer Communications Industry Services; and CSC's European operations. The pending acquisition of CIG Intersys Group, a large Belgian firm involved in

commercial information technology, will add a fifth unit to the new division.

CSC, a \$1.3 billion conglomerate, was one of the earliest professional services firms and has built a strong reputation for managing huge government contracts.

While its presence in the commercial world has been less well known, CSC has won some significant commercial bids, including recent contracts with Weirton Steel, the Massachusetts Water Resources Authority and the New Jersey Joint Underwriters Association.

"CSC has been targeting commercial systems integration for some time now," noted Char-

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Change Action was designed by Action Software International, a company that enjoys developing and supporting innovative software for the mainframe computing environment.

Action Software International is a division of Mazda Computer Corporation with offices in Canada, the United States and West Germany. For more information, call: Canada (416) 470-7113 U.S. (312) 205-1888 West Germany (69) 56-3815



Gerrity was named president of Commercial Systems Group

Lotte Walker, an analyst at County Natwest Securities USA. The acquisition of the Index Group, which made its name servicing Fortune 500 accounts, was an indication that CSC was serious about commercial business, she said. Last week's restructuring, which brings under one banner disparate units pursuing commercial business, formalizes that intent.

Focus on Integration

In an interview last week, Gerrity said his job will be to focus management attention on the integration of the units that make up CSG. The group will deploy cross-unit client teams, drawing on the expertise of the previous 15 autonomous units.

Acknowledging the commercial presence of heavy hitters such as Andersen, Gerrity said industry growth rates of 20% to 30% leave room for competition, adding that CSG plans to be at the high end or above those growth levels.

"We aim to be in the first tier of major firms over the next five years," he said.

Gerrity said CSG's broad range of capabilities and quality track record will distinguish it in the competitive commercial services marketplace.

James A. Champy, former vice-chairman of Index Group, will succeed Gerrity as chairman and chief executive officer of that firm.

British tech hits U.S. shores

BY JULIE PITTA
CW STAFF

SUNNYVALE, Calif. — Personal computer users, brace yourselves for the arrival of yet another technology import.

It's not another personal computer clone from yet another Far Eastern country hoping to make some high-tech money. This immigrant has visited the U.S. many times before in many different guises.

The British are coming again. But this time their arrival won't be kicked off by the appearance of a rock 'n' roll band on the Ed Sullivan Show. This latest invasion has been spurred by the technology boom.

British Software International Ltd. is the latest import from the UK hoping to exploit the U.S.' nearly insatiable hunger for new technology. The UK start-up is developing a prototype of a new distributed database package for Apple Computer, Inc.'s Macintosh personal computer, called Dataclub.

The following step

"We want to exploit the innovations made in the UK," British Software co-founder and President Nick Powell said. "There is a syndrome in the UK. There are lots of inventions created here; we win more Nobel Prizes per capita than any other country. Unfortunately, we've not been able to determine the difference between invention and product."

Powell hails from Alameda, Calif.-based Relational Technology, Inc. He set up the European marketing arm for the U.S. software company. His partner Rob McGregor — the company's research and development vice-president and a co-founder — was the leading developer of UK-based Insignia Solutions' SoftPC, a software product that allowed the Macintosh to emulate an IBM Personal Computer AT.

The principle behind British Software's Dataclub is that PC users linked together through a local-area network prefer to share data directly without having to use the network's server as the focal point of their interaction — hence the term "distributed database."

"It's what would be termed groupware," Powell said. "It has the potential to bring together 100 to 200 desktop computers." British Software has a U.S. patent pending on its technology, Powell noted.

Hey, not bad

Even industry analysts seem to be interested in Dataclub. "I think the concept is quite unique," said Tony Percy, vice-president of software management strategies at Stamford, Conn.-based market research firm Gartner Group, Inc. "It shows that there are still some innovations to be made in the relational database area."

"I'm not sure how far the model can be taken beyond LANs, but in that scheme it's intriguing," Percy said. "It reduces the amount of intelligence required of each node and exploits any extra MIPS."

British Software selected the Mac because Powell and McGregor perceived that there was a lack of rich database software for that platform.

It also serves to ally British Software with Apple — not only a \$2 billion U.S.

company, but a company with a history of actively promoting its third-party developers. However, Percy questions how big a market the Macintosh platform offers for such a product. "They've got some positioning questions to answer," Percy said.

Dataclub will become available late this year but only in the U.S. "It costs almost the same to set up a marketing organization for a small market as a large one," Powell explained.

The U.S. represents a huge, largely homogeneous market, while Europe is considered a collection of small, distinctly different markets. For a company to be

successful in Europe, it must create a sales and marketing organization for each of the larger European countries, Powell maintained.

The decision to exclude Europe, particularly the UK, from its marketing plans has been the source of irritation for at least one party involved — the British government, which has invested in British Software. About \$1 million of the company's initial funding came from the British Technology Group, a government-sponsored consortium to promote technology in the UK. "I don't think they're too excited by this, but they didn't make it a condition of their investment,"

Powell conceded.

Other investors in the organization include Hambrecht & Quist, Inc., the San Francisco investment bank and brokerage house, which contributed \$1 million, and Investors in Industry, Europe's largest venture capital company, which supplied \$2 million.

While the marketing team will comprise Americans, the research and development team will remain in Berkshire, England, where the product will be produced and packaged. "There's a plentiful supply of engineers in Europe. The prices are reasonable, and their loyalty is high," Powell said.



British Software's Powell

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CAEX

FROM PAGE 81

with roots in both geophysics and computer technology. Their goal was to create an interactive computer system for the graphical analysis of three-dimensional seismic data that would allow an explorationist to test, adjust and retest an idea almost instantaneously.

With the Landmark Graphics interactive workstations, which were first unveiled in prototype form in fall 1983, users can view 3-D models of the interior of the

Earth and interpret up to 800M bytes of 3-D seismic data in one-tenth of the time required by traditional pencil and paper technique, according to company claims. The 3-D graphic displays that are not possible on paper assist the interpreter in better understanding the geology of petroleum reservoirs.

According to Chief Executive Officer C. E. (Gene) Ennis, who

joined the company in 1984, Landmark Graphics is maintaining its traditions by employing a technology transfer group. The programmers are actually directed by geophysicists who represent the end users, Ennis said. In addition, the company employs geophysicists and geologists to provide support to users.

Whatever they are doing, it is apparently working. Landmark

Graphics has shown a steady increase in its annual sales since 1984, even as oil prices were falling. Earnings took a drop in the September 1987 quarter when some reliability problems held shipments back, Ennis said. However, the company has been profitable ever since; last fall, it went public.

In its most recent quarter, the company had sales of \$9.9 million and earnings of \$1.4 million, a 71% revenue rise and a 133% increase in profits over last year's comparable period.

Schwarz credited the company's gains largely to its ability to define its applications and target them to the right users. In addi-

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tion, "they are very good in marketing and distribution. They try to live with their customers and are constantly updating their hardware and software." Major customers include Amoco Corp., British Petroleum, Chevron Corp., Exxon Corp., Mobil Corp., Royal Dutch Petroleum, Texaco, Inc. and Unocal Corp.

But the competition is tough. While Landmark Graphics itself claims to hold 44% of the CAEX market, Schwarz said its biggest challenge comes from a Houston-based company called Geowest Systems, which markets its applications on Digital Equipment Corp. hardware and recently landed a \$12.7 million order from China. "They are not as big but are doing relatively well," Schwarz said. Another serious competitor, he said, is Geophysical Co., a Norwegian exploration firm that was acquired by Schlumberger Ltd., "which is marketing a seismic visualization system that is pretty decent."

Consequently, Landmark Graphics is not sitting still. One project under way and aimed at helping the firm hang on to its lead is Open Works, an interface that lets users access applications from different platforms, including Landmark competitors, and integrate them on their own systems. The Landmark systems currently use IBM RT systems running AIX.

Keeping its workers happy is another Landmark Graphics goal, Ennis said. "Everybody owns stock in the company," but compensation goes beyond stocks and salary, he said. "Our long-term objective is to allow people to really make significant cash if the company does well."

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IN BRIEF

Friendlier skies

United Airlines Executive Vice-President and Covia Chairman John R. Zeeman has been named managing director and chief executive officer of Galileo, the 2-year-old joint European-based computer reservation system. Other Galileo partners are Alitalia, British Airways, KLM Royal Dutch Airlines and Swissair, which, along with US Air, make up Covia, an independent affiliate of United Airlines best known for developing the Apollo reservation system.

This LAN is your LAN

Both the federal government and shareholders of local-area network supplier Sytek, Inc. have given Hughes Aircraft Co. the go-ahead to acquire the company. To be known as Hughes LAN Systems, Inc., Sytek will report to its new sister subsidiary, Hughes Network Systems, Inc.

Cashing in

Telecommunications equipment provider Infotron Systems Corp. has signed a letter of intent to purchase Herndon, Va.-based Licom, Inc., a supplier of T3 and fiber-optics products. The cash deal is intended to combine Licom's technology with Infotron's high-speed networking and integrated network management capabilities.

Shopping spree

Only weeks after its acquisition of personal computer-based configuration management vendor Polytron Corp., Rockville, Md.-based Sage Software, Inc. last week picked up Santa Clara, Calif.-based Visual Software, Inc. in a stock-for-stock exchange valued at approximately \$1.9 million.

Hello, Britain

British-based venture capital company Schroder Ventures has committed up to \$7 million to fund Waltham, Mass.-based artificial intelligence pioneer AI Corp.'s expansion into Europe. More than a year in the making, the deal allows AI Corp. to enter markets in the U.K., Holland, France and West Germany without a distributor network.

Bye-bye Britton

Effective today, relational database software and server manufacturer Britton Lee, Inc. — following a brief stint as Sharebase from Britton Lee, Inc. — has changed its name to Sharebase Corp. The company now solely bears the name of its software line.

Stratus pockets

CONTINUED FROM PAGE 81

puters directly in Japan, Hong Kong and Australia. Distributors grab sales for the company in North Korea, Taiwan, Singapore and Thailand. Korea Securities Computer Corp., which operates computers for the Korea Stock Exchange, recently installed three of Stratus' XA 2000 systems for conducting stock exchange operations.

In contrast to the ease of doing business in Japan, bureaucracy and export requirements compound the difficulty of operating in China, according to Bergeron. "We have to be concerned with fluctuating currencies so we don't sell a product

at a specific margin and two months later realize that we have a problem," he said.

Bergeron claims that the serviceability of its fault-tolerant computers, while advantageous worldwide, sets it apart from other fault-tolerant computer manufacturers in the Pacific Rim.

In China, where support is difficult because many computers operate in remote locations, the service capability has become a major enticement, Bergeron said. Last year, the firm won contracts with Visa International and the Bank of China for credit card authorization systems. Stratus computers will also serve as the hub of

an electronic information network during the Asian Games in 1990.

Although the firm does not tailor its systems for specific countries, it purchases peripherals — for example, workstations — in the countries in which it sells its systems.

In addition to fault-tolerant operations, the firm offers 24-hour service through its worldwide customer assistance centers. Currently, the firm is putting an assistance center in Australia, augmenting the Hong Kong center. The Hong Kong center serves as a backup for Stratus distributors throughout the Pacific and is backed up at U.S. headquarters.



Stratus'
Bergeron

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CCIA backs mandatory central network

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Computer & Communications Industry Association (CCIA) has thrown its weight behind the concept that federal agency participation in the government's FTS-2000 centralized network should be mandatory.

In typically maverick fashion, the CCIA position runs counter to the view of several data communications vendors and systems integrators that fear the legislative mandate locks them out of the federal market for the 10-year life of the FTS-

2000 contract [CW, April 24]. The U.S. General Services Administration (GSA), which awarded the massive contract to AT&T and U.S. Sprint Communications Co. last year, has ordered many federal agencies to scrap their plans for independent data networks with other vendors.

In a May 1 letter to the GSA, CCIA President Jack Biddle said mandatory use of the central network "is the only basis on which FTS-2000 can be given a chance to succeed." He said the mandate's premise was that the government would get a better price by combining agency requirements under a single procurement.

AT&T, naturally, agreed with Biddle's analysis. "Cream-skimming for the benefit of individual agencies or locations cannot be allowed because that would leave the government, in essence, with skim milk or a suboptimized FTS-2000 network," said Richard J. Lombardi, AT&T's vice-president of federal systems, in a May 2 speech in Norfolk, Va.

The CCIA did urge the government to take several steps to clarify the mandate:

- Provide systems integrators with the technical and pricing data necessary for them to incorporate FTS-2000 services in their bids for other procurements.

These vendors need a neutral point of contact, because they may be competing against AT&T or U.S. Sprint.

- Make clear that third-party vendors have no liability for FTS-2000 performance or pricing disputes, because FTS-2000 is out of their control.
- Ensure that AT&T and U.S. Sprint cannot use their FTS-2000 profits to subsidize other federal procurements.
- Establish criteria for allowing waivers from the mandate in special instances.
- Ensure that future add-ons to the FTS-2000 mandatory services will not amount to sole-source contracts.

AT&T's Lombardi supported CCIA's comments and urged the formation of a vendor and agency council to address FTS-2000 issues and disputes.

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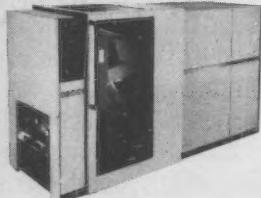
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CC2030-019 WLM 837

Margolis

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their ilk. There have been times when questions have arisen about HP's share in a given market. Its integrity, however, has never been in doubt.

Industry acclaim of the HP/Apollo accords, however, isn't just a matter of the acquirer's integrity. "Who else could have bought Apollo?" asked Richard Shaffer, president of New York-based market research firm Technologic Partners. "No company that fits as well." In addition to a rare string of synergies both technological and corporate, Shaffer pointed out, the price is right: HP's \$475 million offer "amounts to something like \$4,000 for each customer in the Apollo installed base." The acquisition, he noted, "isn't expensive for HP."

The same can hardly be said of MAI's proposed Prime takeover, which is leveraged to the hilt and backed by junk bond promises from Drexel Burnham Lambert.

How bad is it? Dan Jones, head of Employees Against the Takeover, a group of Prime employees whose name says it all, summed up many of the generally held reservations in a recent letter to LeBow. If MAI really wants to run Prime rather than sell it off, Jones asked, how come LeBow, who is leading a proxy fight to gain control of Prime's board, has said that he will entertain third-party offers for Prime if elected? Why is LeBow depending on Drexel Burnham Lambert, which recently pleaded guilty to six felony counts in Federal Court, for financial backing? Why has a string of liquidations and bankruptcies followed LeBow in his career as a corporate leader?

"Mergers used to be constructive, producing economies and employing synergies that increased employment and enhanced competition in both the national and international marketplaces," Jones said. "The new merger mania reduces employment, cuts competition, funnels large amounts of money to a few people, sells pieces of companies for cash... and reduces international competitiveness." LeBow's proposal, Jones said, "has the look and feel of a new-style, destructive merger."

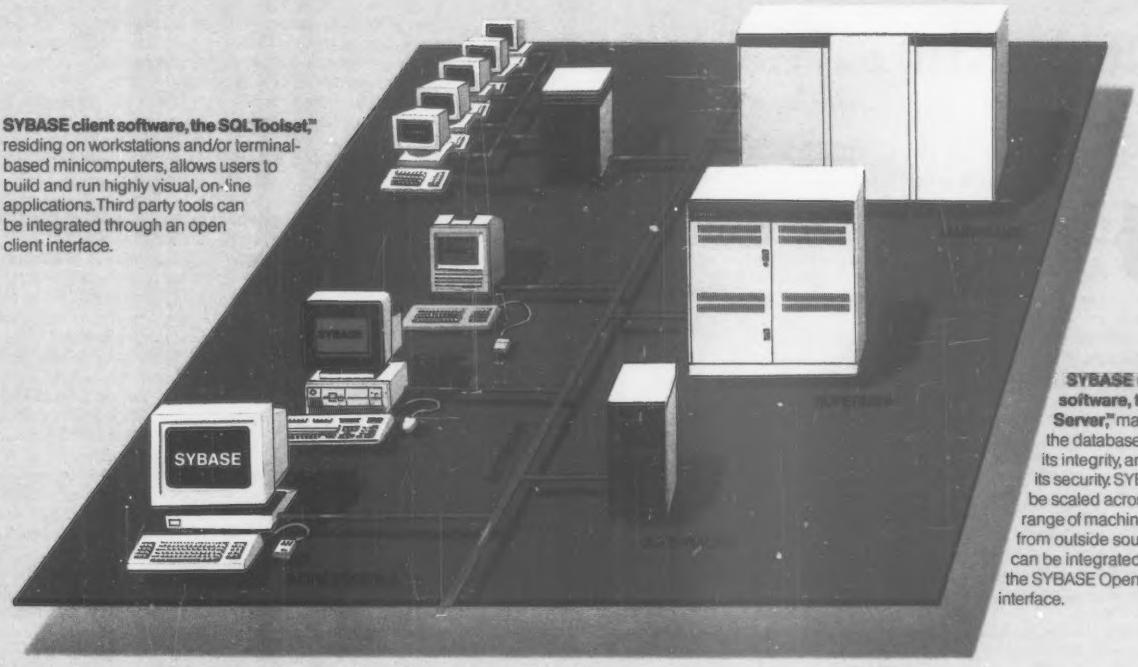
Dear Dan: The good news is, the old-style merger lives. The bad news is, as currently ranged across the California-Massachusetts axis, it lives in Palo Alto and Chelmsford, not in Tustin and Na-

Margolis is *Computerworld's* senior editor, industry.

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COMPUTER CAREERS

IS meets the factory floor

Top computer-integrated manufacturing jobs call for effective orchestration

BY JANET MASON
SPECIAL TO CW



Because the implementation of computer-integrated manufacturing (CIM) requires a company to develop a strategic overview, top-level executives are often the first information systems people to get involved with it.

CIM integrates the plant floor and other areas of the enterprise with a computerized flow of data.

Bob Crowder, president of Ship Star Associates, Inc., a consulting firm in Newark, Del., says that he has seen interest in CIM double during the past couple of years, although such interest seems to be growing faster than implementation.

"Companies are looking seriously at CIM and considering it for the future," Crowder says. He adds that CIM is a long, complex process; a feasibility study alone can take six months to a year.

In firms employing CIM, executives in IS are working in tandem with managers from production and engineering organizations. The IS executives often face hurdles in learning the manufacturing process and new hardware and software. Another

challenge is motivating employees from different parts of the firm to work with each other.

Along with its challenges, the CIM arena also offers myriad benefits to IS managers. "CIM allows MIS people to learn more about the integral workings of a company," says Julie Pingry, editor of "CIM Strategies," a newsletter published by Cutter Information Corp. in Arlington, Mass. "It can be a big opportunity for MIS managers to get in and make an impact on the bottom line."

'Guts of the company'

It is this expansion of IS managers into the production side — or "guts of the company," as Pingry puts it — that offers them increased mobility, sometimes extending past the IS function.

In addition to working outside the function, the IS manager with CIM under his belt may find greater opportunities to move to another company because of his manufacturing expertise, according to John Sullivan, vice-president and managing director of the Boston division of executive search firm Korn/Ferry International.

When Terry Fearn moved from IS to management of a CIM group at Timken Co. in Canton, Ohio, he found an immediate ad-

vantage in the autonomy of his new position. "I now work for the plant manager, who is not particularly computer-oriented, so most of the decisions are left to me," says Fearn, area manager of process control systems at Timken's Fair Crest Steel Plant.

Most large firms searching for CIM managers tend to pro-

THE TOP IS PERSON has to be able to relate well to the people on the shop floor. And the shop-floor mentality is a lot easier to understand if the IS manager has worked there."

JOHN SULLIVAN
KORN/FERRY INTERNATIONAL

mote from within, Sullivan says. But, he adds, "some high-growth companies are forced to look outside their ranks for talent."

Like Fearn, many IS managers who move into CIM have a background in manufacturing.

Fearn began working for Timken as a programmer in 1971, proceeded to IS management and eventually worked on a steel division project team. "Until that point, I didn't know anything about manufacturing steel," Fearn says. After learn-

ers often must learn about hardware produced by a variety of vendors. While IBM is often the signature of corporate IS, many production systems tend to be run on hardware from Digital Equipment Corp. and Hewlett-Packard Co.

"It also helps to understand different types of applications such as relational databases and multivendor networks," Crowder says.

Fearn, however, emphasizes that mastering the technology is not the greatest challenge. "The

most important skill I brought with me from MIS was the ability to manage technical people," he says.

The CIM group that Fearn manages includes IS people who maintain the plant-level system, technical support engineers, engineers who maintain the process control systems and operators who work on the system around-the-clock.

The ability of IS managers to relate to the production personnel is one reason that firms request IS managers from a manufacturing background. "The top IS person has to be able to relate well to the people on the shop floor," Sullivan says. "And the shop-floor mentality is a lot easier to understand if the IS manager has worked there."

This cross-functional teamwork can have a substantial impact on the company's operations. "When MIS and manufacturing managers work together, they see eye-to-eye on what they are trying to accomplish and tend to get to the bottom line faster," Pingry says.

In addition, the success of CIM often depends on the ability of the IS manager to explain the benefits of the technology to the rest of the company's management.

"It is the job of the top-level IS manager to recognize the possibilities of CIM and to translate them to corporate management," Crowder says.

Mason is a Philadelphia-based freelance journalist.

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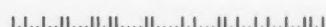
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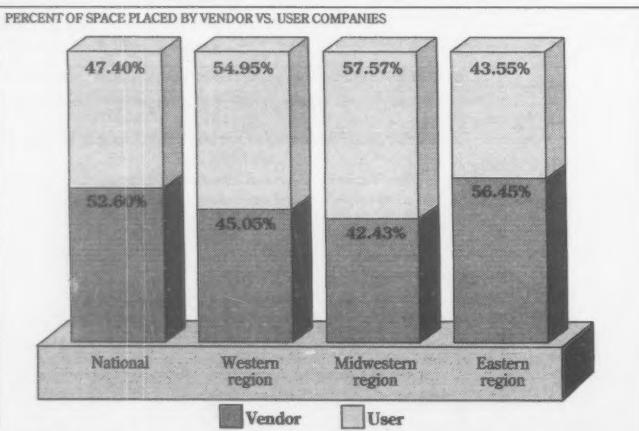
- Sr. P/A - HP3000 - View - Powerhouse billing and fulfillment system
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CAREER INDEX

March 1989 computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in Computerworld and selected major U.S. newspapers

SOURCE: CW PUBLISHING, 1989 RECRUITMENT MARKET RESEARCH DATABASE

TOM CRANE: FRANK C. O'CONNELL

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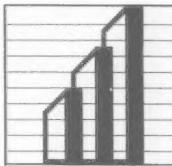
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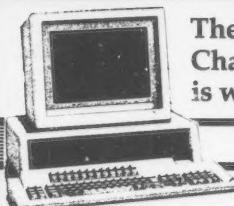
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MARKETPLACE

PC insurance: User-unfriendly?

A policy may ease your mind, but securing one may not be a snap

BY RICHARD PASTORE
CW STAFF

One benefit of insurance is the peace of mind that it imparts. This is ironic when it comes to buying insurance for smaller computer systems, because finding coverage for them can be anything but relaxing.

The process is laden with obstacles — from finding a company that will issue a policy to securing coverage that is appropriate. However, educating yourself before you go shopping could be your insurance against frustration.

Perhaps the most challenging aspect of the insurance gauntlet is finding a company that will write your policy, particularly if your system is valued at less than \$100,000. Insurance industry sources say the complexity and relatively low commissions involved discourage agents from dealing with such small policies.

"A regular agent just doesn't have the time to bother with a small computer policy; he'd have to do it in high volume to make a living at it," says David Johnston, chief executive officer of Columbus, Ohio-based Safe-ware, The Insurance Co., a firm with the unusual specialty of un-

derwriting coverage for small systems.

As an alternative, small systems owners can jury-rig coverage from a general business plan. But such policies often do not protect against computer-specific perils such as a power surge. Also, the equipment, media and data must be scheduled on separate riders, which can add significantly to the premium, says Steven Bender, an Oakland Gardens, N.Y.-based author of computer reviews and an insurance customer.

Cover the works

When and if you do find a willing agent — through trial and error or by recommendation — you need to make him aware that the value of your computer system goes beyond the hardware to include packaged software, custom programs and stored data. If you don't, your blanket policy could turn out to be very threatening come claim time.

"You have to look and see whether what you are buying will simply reimburse you for empty disks or will pay for the physical media, the off-the-shelf software and your own software," says Louis Olenick, a New York attorney and an ex-

pert in computer law. "If all you're going to get is the value of the empty disks, you're not getting very much."

Olenick emphasizes the need to make agents aware of custom-

A REGULAR AGENT just doesn't have the time to bother with a small computer policy; he'd have to do it in high volume to make a living at it."

DAVID JOHNSTON
SAFEWARE

ized applications. Customization, he says, is generally considered a service, and the costs of recreating custom software will not be insured unless the policy specifically states so.

"What someone might consider adequate coverage is going to be quite costly and may not even be available," says Sanford Sherizen, an information security and contingency planning consultant and president of Data Security Systems, Inc. in Natick, Mass. "Because of liability losses and shake-ups, the insurance industry is being extremely careful about what it does and does not cover."

You must also hash out the premium. As with other types of insurance, it often hinges on deductibles. Insurance firms may set the deductible as a flat dollar rate or base it on a certain number of hours needed to get the business back up and running, Olenick says. "If you say, 'I want the lowest possible premium,' then they'll say, 'Well, how about if we don't pay any dam-

that they remain insurable. Their premiums may even go down if extensive security measures are implemented, he says.

At claim time, the burden of proof of ownership and loss falls squarely on the customer. Businesses generally keep purchase records, but the firms that do not must scramble. "You can be creative and use all sorts of things — credit card bills, receipts, canceled checks," Johnston says.

For losses related to computer crime, police reports — both past and present — are essential. "If records indicate that you had a previous [crime-related] incident, and you let someone go and did not report that person to the police, that may invalidate your coverage," Sherizen warns.

Pastore is a Computerworld copy editor.

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Digital Computer Resale

The BoCoEx index on used computers

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AT Model 099	\$1,500	\$2,000	\$1,525
AT Model 239	\$1,800	\$2,100	\$1,775
AT Model 339	\$2,000	\$2,375	\$1,800
PS/2 Model 60	\$3,075	\$3,100	\$2,500
PS/2 Model 80	\$3,850	\$4,100	\$3,100
Compaq Portable I	\$550	\$750	\$550
Portable II	\$1,900	\$2,100	\$1,750
Portable III	\$2,700	\$2,950	\$2,400
Portable 286	\$1,700	\$1,975	\$1,675
Plus	\$1,000	\$1,200	\$900
Deskpro 286	\$1,900	\$2,350	\$1,800
Deskpro 386	\$2,625	\$2,900	\$2,500
Apple Macintosh 512	\$550	\$775	\$550
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TRAINING

Welcome to Unix training

The flexibility of Unix frees users but demands a lot from trainers

BY RAY SWARTZ
SPECIAL TO CW

Consider the following common scenarios involving training in the Unix system:

- A senior programmer with 15 years of experience in Fortran and assembler is asked to help complete a C program that is being written on the Unix system even though the programmer has never worked in C or Unix.
- A company decides to buy a Unix-based computer system without realizing that someone will have to set it up and administer it. When the machine arrives, the employee with the most computer experience is put in charge of the system. The employee has never worked on a Unix system.

- To remain competitive, a company buys engineering workstations to help automate its production process. The training department is given the task of quickly getting the designers up to speed on the new equipment.

The training required by a programmer with 15 years of experience is different than the

training needed by a new Unix system administrator or a design engineer using computer-aided design tools. A single "User's Introduction to the Unix System" class won't do.

This situation sharply contrasts with many other types of computer technology training that can be covered with the usual introductory, intermediate and advanced courses.

The Unix challenge

Designed originally as a programming environment, the Unix system presents a challenge to today's trainers. Unix training requires an instructor to know much more about the topics covered in each class than training in DOS, personal computer applications or similar subjects. This is because Unix is so flexible that any piece of it can be used in many different ways.

The Unix "grep" command illustrates this flexibility. At its simplest, the command can be used to search for text in a file in a manner similar to a word processor.

On a more sophisticated level,

the command can search for elaborately-defined patterns in the manner of a database program. Developers can incorporate the command into an application to perform tasks such as verifying dates.

The features and capabilities of Unix can be used directly as part of applications or as development tools. Without understanding how Unix works in its entirety, trainers will find themselves without answers to many students' questions.

The difference between Unix and other environments arises for two reasons. First, the Unix command processors — the Bourne, C and Korn shells — offer powerful programming languages that allow users to create their own applications. Secondly, Unix provides many unusual commands — such as grep — that are useful both individually and in combinations. Every topic can be considered as part of a larger programming language.

The real Unix training challenge is being able to teach the same concepts in different ways, depending on the students in the

class. Unix trainers must be able to teach users, programmers and system administrators in ways meaningful to the needs of each group.

Furthermore, within each of the groups there are gradations of technical knowledge that must also be accommodated. While these are important issues in every training class, the flexibility of Unix combined with the wide audience range makes every Unix training class unique.

As Unix becomes more popular and begins penetrating traditional MIS environments, its impact on corporate training organizations will become more pronounced.

Know it all

Trainers will have to become intimately acquainted with Unix. A trainer must constantly keep the big picture — the entire Unix System — in mind and possess the background to explain this larger view and how the topic at hand fits into it.

This notion is not meant to suggest that only programmers should be trained to use Unix. In fact, just the opposite is true. The power and flexibility of Unix provides users a kind of computerized carrot that allows them to do more as they learn more. Even new users can be made

aware of the features of the entire system.

To provide adequate Unix training, companies need to set up a curriculum of courses to serve their user communities. They must build a growth path into the schedule to allow people to learn more as they gain experience. Given the Unix system's capabilities, such training can quickly pay for itself with increased productivity.

The first step in creating a corporate Unix curriculum is to assess the current level of Unix capability. This is often done by using a simple questionnaire. The next step is to determine what level of Unix training is required and where it is needed, allowing growth for individuals and the company.

In some cases, corporate training departments will not possess the expertise to create a Unix curriculum appropriate for their organization. An alternative approach is to consult with an experienced Unix trainer who can help craft a curriculum that includes the correct topics and ensures that the courses are taught at the appropriate level.

Swartz is an editor-at-large of *Unixworld* magazine and the founder and president of Berkeley Decision/Systems in Santa Cruz, Calif.

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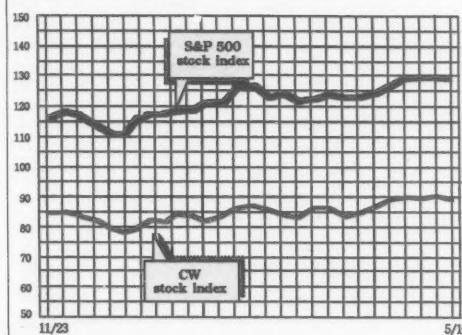
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Restructuring MIS —
Organizational Impact
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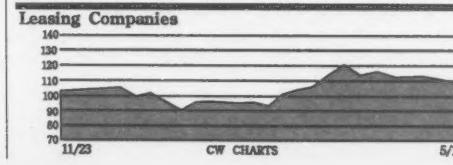
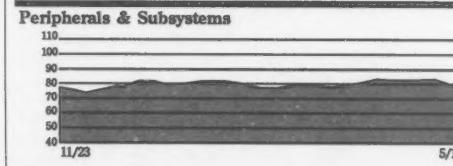
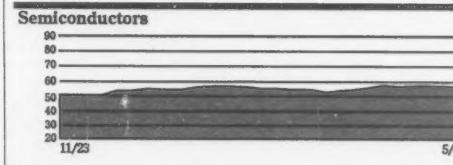
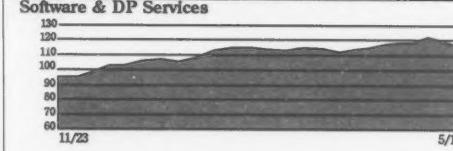
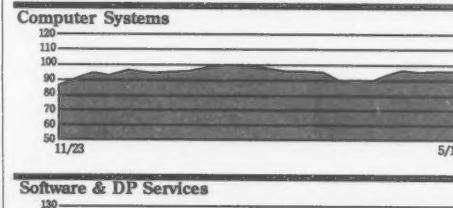
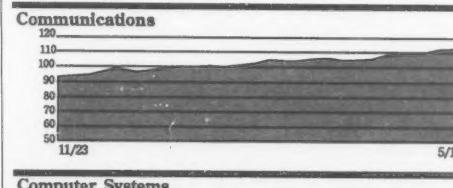
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STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	112.2	113.6
Computer Systems	95.5	95.5
Software & DP Services	121.0	116.3
Semiconductors	58.6	58.4
Peripherals & Subsystems	81.6	78.2
Leasing Companies	111.9	109.1
Composite Index	90.0	88.5
S&P 500 Index	129.8	128.6



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 10, 1989

EXCH	PRICE 52-WEEK RANGE (1)	CLOSE MAY 10, 1989	WEEK NET CHANGE	WEEK PCT CHANGE	37	26	35.25	0.0	0.0
N	SYSTEMATICS INC	21	12	21	37	26	35.25	0.0	0.0
N	SYSTEM CENTER INC	28	9	21	37	26	35.25	0.0	0.0
N	SYST. SOFT INC	28	9	21	37	26	35.25	0.0	0.0

Communications and Network Services

N	AMERICAN INFO TECHS CORP	58	43	55.375	-0.8	-1.3	N	ADV MICRO DEVICES INC	17	7	8.75	-0.1	-1.4
Q	ANDREW CORP	22	15	19.75	-0.1	-0.6	Q	ANALOG DEVICES INC	16	10	11.125	-0.1	-1.1
Q	ARTEL COMM CORP	5	1	4.375	-0.3	-2.8	Q	ANALOGIC CORP	10	6	9.625	0.3	2.7
Q	AVANT GARDE COMP INC	3	0	0.5	-0.1	-2.9	Q	ANSWERTECH TECHNOLOGIES INC	20	17	18.75	-0.3	-3.3
Q	AVANTEK INC	7	4	5.375	0.3	4.9	Q	INTEL CORP	37	19	22.25	-0.3	-0.8
Q	AYDIN CORP	16	13	14.75	-0.4	-2.5	Q	LSI LOGIC CORP	14	8	11.5	0.0	0.0
Q	BELL & HOWELL CORP	84	65	81.25	-1.1	-1.4	Q	MICRON TECHNOLOGY INC	26	15	22.5	0.1	0.6
Q	BELLSOUTH CORP	47	39	45	-1.6	-3.6	Q	MOTOROLA INC	55	36	47.875	-0.3	-4.8
Q	COMPRESSION LABS INC	6	3	6.125	0.5	8.9	Q	NTL ATLANTA SEMICONDUCTOR	51	35	7.75	-0.4	-0.9
Q	COMPUTER NETWORK TECH	23	17	17.75	0.3	1.4	Q	TEXAS INSTRS INC	17	11	39.5	-0.4	-0.9
Q	CO-OP COLOR CORP	1	1	1.282	-0.1	-8.9	Q	WESTERN DIGITAL CORP	17	11	11.5	-0.1	-1.1
Q	DATASTREAM CORP	9	4	4.75	-0.1	-1.1							
Q	DIGITAL COMM ASSOC	38	17	22.875	2.0	9.6							
Q	DYNATECH CORP	23	17	17.75	0.3	1.4							
Q	FIBRONICS INTERNATIONAL INC	5	3	5	0.8	17.6							
Q	GANDALF TECHNOLOGIES	8	4	5.5	0.1	2.3							
Q	GENERAL DATACOMM IND	6	3	5.375	0.3	4.9							
Q	GTE CORP	52	34	49.875	1.3	2.6							
Q	NETWORK SYS CORP	14	10	10	0.0	0.0							
Q	ITC CORP	60	45	56.125	-0.2	-4.1							
Q	MAA COM INC	11	8	7.875	-0.1	-1.6							
Q	MCI COMMUNICATIONS CORP	36	13	35	1.4	4.1							
Q	NET WORK EQUIPMENT TECH	25	14	23.25	0.5	2.2							
Q	NETWORK SYS CORP	12	8	8.75	-0.1	-1.4							
Q	NORTHERN TELECOM LTD	20	14	17.25	-0.4	-2.1							
Q	NOVELL INC	38	21	33.75	-1.0	-2.9							
Q	NYX CORP	75	60	72	-0.5	-3.3							
Q	PACIFIC TELESIS GROUP	39	28	38.5	0.3	0.7							
Q	PENNIRL CORP	6	4	5.5	0.1	2.3							
Q	PLESEY PLCS INC	29	25	43.75	-0.8	-1.7							
Q	NETWORLD ATLANTA INC	18	10	17	-0.1	-1.9							
Q	SOUTHWESTERN BELL CORP	49	34	48.25	0.3	0.5							
Q	3 COM CORP	28	16	26.5	1.9	7.6							
Q	U.S. WEST INC	66	51	65.125	0.4	0.6							

Computer Systems

Q	ALLIANT COMPUTER SYS	7	3	4.825	-0.1	-2.6	Q	ALLOY COMP	4	2	2.375	0.4	18.8
Q	ALPHA MICROSYSTEMS	8	5	7.625	0.1	1.7	Q	AMT INTL INC	6	4	5.875	-0.1	-2.1
Q	ALTOS COMPUTER SYS	10	6	6.375	0.0	0.0	Q	AST RESH INC	17	7	8	0.0	0.0
Q	AMDAHL CORP	28	16	18.625	-0.6	-3.2	Q	ASTROL TROL TECH CORP	6	4	5.125	0.3	5.1
Q	APPLE COMPUTER INC	17	7	15	0.1	0.6	Q	CAPIER DATA PRODS INC	11	8	4.375	-0.1	-1.3
Q	APPLE COMPUTER INC	48	34	43.125	2.9	7.1	Q	CONCERN PERIPHERALS	11	7	11.125	0.8	7.2
Q	BOLT BERANEK & NEWMAN	19	7	7.5	-0.4	-4.8	Q	CONNEX CORP	5	2	2.688	-0.2	-6.5
Q	BRITTEN LEE INC	4	2	2.188	-0.4	-14.6	Q	INTERLOGIC INC	17	6	8.375	-0.3	-2.9
Q	COMPEX SYSTEMS INC	92	47	77.5	0.1	1.1	Q	INTERTECH CORP	5	2	2.688	-0.2	-6.5
Q	COMPUTER AUTOMATION INC	10	3	4.5	-0.3	-5.3	Q	KOMEKA CORP	12	7	11.125	-1.1	-6.7
Q	CONCURRENT COMP CORP	20	5	5.625	0.0	0.0	Q	MAXTOR CORP	13	9	2.75	0.0	0.0
Q	CONTROL DATA CORP	28	16	19.625	-0.6	-3.1	Q	MASTOR SYS CORP	4	2	2.125	-0.1	-3.4
Q	COMPLEX COMPUTER CORP	13	7	12.75	1.5	13.3	Q	MAXTOR CORP	15	6	10.5	0.3	2.4
Q	GRAY REED CORP	68	48	50.5	-0.5	-1.1	Q	MICROPLS CORP	25	16	6.25	-0.6	-3.8
Q	DAISY SYS CORP	12	4	4.125	0.0	0.0	Q	MINNEAPOLIS MFG & MFG CO	14	3	3.062	-0.6	-15.5
Q	DATA GEN CORP	25	14	16.75	-0.8	-4.3	Q	PERSONAL COMPUTER PRODUCTS INC	74	57	7.5	0.6	0.9
Q	DATAPOINT CORP	6	4	3.75	0.0	0.0	Q	PRIMARION INC	2	1	0.688	0.1	10.1
Q	DEC COMPUTER CORP	12	7	7.25	-0.3	-5.3	Q	PRIMARION INC	11	7	7.75	0.1	1.6
Q	FLOATING POINT SYS INC	122	86	96	-0.6	-6.6	Q	QUANTUM CORP	14	6	13.75	-0.6	-32.9
Q	HARRIS CORP	31	25	29.5	0.3	0.9	Q	RECOGNITION EQUIP INC	12	6	7.875	-0.6	-7.4
Q	HONEYWELL PACKARD CO	78	57	76.125	-0.1	-1.8	Q	SEAGATE TECHNOLOGY	19	7	14.375	0.9	6.5
Q	IBM	131	106	109.625	-1.9	-1.7	Q	STORAGE TECH CORP	4	1	1.5	-0.3	-14.3
Q	INFORMATION INT'L INC	18	12	15.375	0.0	0.0	Q	TANDON CORP	3	1	0.75	-0.1	-7.7
Q	IPL SYSTEMS INC	7	1	6.25	0.1	2.1	Q	TELETRONIX CORP	5	2	4.062	-0.4	-10.0
Q	MAX BASIC FOUR INC	21	7	7.125	0.1	0.0	Q	TELETRONIX INC	21	19	22.25	0.0	0.0
Q	MATSUSHITA ELEC IND'L LTD	219	160	183.5	7.6	4.3	Q	XEROX CORP	69	50	66.625	0.4	0.6
Q	MEGADATA CORP	3	1	1.375	0.1	4.8							
Q	MENTOR GRAPHICS CORP	39	23	37.125	0.9	2.4							
Q	MINI-COM CORP	6	1	2.5	0.1	0.5							
Q	PRIME COMPUTER INC	21	12	18.75	-0.1	-0.7							
Q	PYRAMID TECHNOLOGY	20	11	14.25	0.5	3.6							
Q	QUALITY TIME CORP	32	21	17.5	-0.5	-5.0							
Q	STRATUS COMPUTER	21	13	18	0.9	5.1							
Q	SUN MICROSYSTEM INC	21	13	1.25	-0.1	-2.8							
Q	SYMBOLICS INC	3	1	2.188	-0.1	-2.8							
Q	SEQUENT COMPUTER SYS INC	28	14	24.5	0.4	-3.0							
Q	TANDEM COMPUTERS INC	21	12	17.25	0.5	3.0							
Q	TANDY CORP	49	38	42.875	-0.6	-1.4							
Q	ULTIMATE CORP	14	8	10.25	0.4	3.8							
Q	WANG CORPS INC	39	25	24.5	-0.3	-1.0							
Q	WANG LABS INC	7	5	8.25	0.5	6.5							

Software & DP Services

Q	AMERICAN MGMT SYS INC	19	12	13.75	0.5	3.3	Q	CAPITAL ASSOCIATES INTER-NATIONAL INC	9	4	7.5	-0.1	-4.8
Q	AMERICAN SOFTWARE INC	16	8	15.375	-0.8	-33.5	Q	CONDISCO INC	29	19	25	0.8	3.1
Q	ANACOMP INC	12	5	6.5	0.0	0.0	Q	DATASTREAM CORP	7	0	0.562	-0.1	-18.2
Q	ANALYSTS INT'L CORP	25	19	21.75	1.1	5.3	Q	DATASTREAM CORP	17	10	14.75	0.0	0.0
Q	AUTODESK INC	37	23	36.25	0.5	1.4	Q	DATASTREAM CORP	10	7	13.125	-0.1	-18.2
Q	AUTO DATA PROCESSING	42	23	38.625	-0.4	-1.0	Q	DATASTREAM CORP	10	7	13.125	-0.1	-18.2
Q	BMC SOFTWARE INC	20	8	19.5	-0.3	-1.3	Q	DATASTREAM CORP	10	7	13.125	-0.1	-18.2
Q	BUSINESS LINE INC	15	9	18.75	0.0	0.0	Q	DATASTREAM CORP	10	7	13.125	-0.1	-18.2
Q	COMPUTER HORZONS INC	40	24	36.875	-0.6	-1.7	Q	DATASTREAM CORP	10	7	13.125	-0.1	-18.2
Q	CORPORATE SOFTWARE INC	59	35	52.5	0.5								

SAA gets on the E-mail route

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM's expected Officevision announcement this week will include the beginning of an enterprise-wide electronic mail system, which has been noticeably absent from its Systems Application Architecture (SAA) platform.

But tomorrow's rollout will avoid some important issues, industry spokesmen said, such as how IBM will integrate its two competing host-based E-mail systems — Professional Office System (Profs) and Distributed Office Support System (Disoss).

SAA

FROM PAGE 1

strate the cooperative processing capabilities of its unshipped 1-2-3 Release 3.0 and 1-2-3/G, which will fit into its cooperative processing strategy.

Borland International plans to tie its Paradox database management system to micro-based servers. The plan for host access has not been set. Initially, Borland will rely on these servers to act as gateways to host systems. The firm is not expected to be present at the announcement.

Ashton-Tate Corp.'s initial thrust will be to connect to a variety of host computers in order to share files. The ultimate aim, however, is to have the Dbase language execute on hosts to provide a truer form of cooperative processing, said Jan Brudin, director of connectivity at Ashton-Tate, which is also not expected at the announcement.

Almost all host-oriented software makers contacted last week have geared up for the

— into the new system, and how the vendor will support the X.400 electronic mail standard.

A spokesman from Vancouver, B.C.-based software company Consumers Software, Inc., confirmed that the products formerly labeled SAA Office will be named Officevision. Consumers has been working to provide a PC-DOS version of the E-mail system for users on IBM Personal Computer local-area networks, he added.

The DOS-based software will include a windows-based user interface with approximately the same look and feel as IBM's Officevision-based E-mail sys-

tem, the spokesman said. A Personal System/2 running OS/2 Extended Edition will act as an E-mail server, allowing PC users to exchange messages with the Officevision E-mail network.

IBM will first deliver OS/2 Extended and an MVS version of Officevision, according to Chuck White at Gartner Group, Inc., a Stamford, Conn.-based market research firm, and then release an Application System/400 version of Officevision a few months after the MVS version. "The first SAA Office will not be full-function; we anticipate a staged rollout across many years, many platforms," he said.

move to PCs. Even Cullinet Software, Inc., which will not announce its Officevision strategy, is developing Presentation Manager front-end tools, said company spokesman Michael Greeley.

The big-iron software vendors argue that host architectures are more complicated and that issues such as data integrity, security, data recoverability and multiuser access take years to master.

The PC firms counter with the assertion that software will be sold based on its usability, an area they dominate. "It's hard enough for us. Imagine what it is like for a mainframe developer to move to a graphical user interface," Raikes said.

Trying to look good

Like their PC brethren, mainframe vendors still have a lot to prove. Some host-oriented firms, however, have already been taking a strong stab at the PC market, and in some limited instances, they have succeeded.

Computer Associates International, Inc., for example, sells

an array of add-in tools for 1-2-3 and Supercalc 5, its own highly regarded but relatively slow-selling spreadsheet. Likewise, Oracle Corp. has staked out an ever-strengthening position in the PC DBMS market but has yet to provide effective end-user tools. Others have tried but failed in the quest for PC market share (see box at right).

Skeptical users interviewed last week plan to let the software do the talking. "There is no blanket answer. It is, however, a great market for systems integrators," said Frank DiSparra, vice-president of technology services at Fidelity Investments in Boston, who said he will go with what works. DiSparra added that he does not take any vendor's claims at face value.

The General Conference of Seventh Day Adventists will evaluate each offering on a case-by-case basis, said MIS Director George R. Ramsey. "I am not sure either camp would have the edge," Ramsey said.

There are political problems when both camps try to embrace

VM, which does not currently support IBM's Systems Network Architecture Distribution Services (SNADS), will probably be the last system to be brought into Officevision, White explained. SNADS is a key SAA element that provides connectivity and routing functions for distribution of documentation across multimode networks.

Excluding VM from Office-

vision, which White does not expect before 1992, leaves Profs users out in the cold. Industry sources estimate there are six to seven times as many Profs sites as there are Disoss sites. Until IBM releases a VM version of Officevision, Profs users will have to tap into the system via an existing Disoss-to-Profs gateway — a less-than-ideal solution, the sources said.

All-star prospects

Strengths and weaknesses of the expected major players in cooperative processing:

- **Lotus:** Has stated commitment to moving 1-2-3 to larger machines, but many are skeptical that the market is there. Previous connectivity deals have borne little fruit.
- **Microsoft:** The PC zealots want nothing to do with large-systems software. However, the recent announcement of an IBM SNA gateway for LAN Manager indicates the firm wants to be part of any linking going on. Plans to work with third parties to connect applications to host systems.
- **Ashton-Tate:** Plans to move Dbase to DEC's VAX and already connects to IBM's System/36 and 38. Connections to Unix, IBM's AS/400 and 370 on the way.
- **Orland:** Has been talking corporate computing for the last year and plans to connect Paradox to PC-based servers via an SQL interface. Big-systems software products unlikely.
- **Cullinet:** Goldengate PC software and early alliances with Lotus and Apple were spectacular flops, but a rejuvenated host product line could change matters. Committed to IBM's SAA, OS/2 Presentation Manager and cooperative processing.
- **Oracle:** Is everywhere but has reputation as user-unfriendly. Cooperative processing ahead, despite no graphical tools.
- **McCormack & Dodge:** Has full SAA support in newest Millennium version, including Presentation Manager workstation. Only previous PC work was in upload/download territory.
- **Management Science America:** A spectacular early failure in the PC market with purchase and later sale of Peachtree Software. However, it now pledges full SAA support, and Brightview cooperative processing software is drawing praise.
- **Computer Associates International:** Acquired PC software expertise and products. Ready for SAA desktop fray.
- **IBM:** Officevision should help its PC software reputation.

a new area, as Saros Corp., founded by both a PC expert and a mainframe programmer, discovered. "We didn't communicate for the first few months," Wayne Carpenter, vice-presi-

dent of engineering, said of his partner, who defected from Microsoft. These cultural and political hurdles are often more difficult to overcome than technical difficulties, vendors said.

RACF's reach to include PCs, minis

BY JEAN S. BOZMAN
CW STAFF

ST. LOUIS — IBM is developing new software security systems that will work beside Resource Access Control Facility (RACF), the flagship security and access control system for IBM mainframes.

The plan was announced to more than 400 IBM mainframe users at the RACF-89 user conference sponsored by Vanguard Security, Inc. here last week.

Bill Vance, director of secure systems at IBM's Enterprise Systems Division, said IBM's goal is to ensure the integrity of data passing through a network of mainframes, minicomputers, workstations and IBM Personal System/2s. RACF works by authorizing user IDs so that groups

of users can access IBM MVS, MVS/XA, VM and VM/XA system resources.

Vance told the RACF conference that RACF look-alikes for the Application System/400 and the PS/2 will likely emerge as components of the OS/400 and OS/2 operating systems, respectively. IBM would like to provide a "menu" approach to security, Vance said, so that users with fewer security requirements could install fewer security modules than large corporate users, for example.

One RACF user who attended the conference said he sees his



IBM's Vance aims to extend RACF's reach

role changing right along with that of RACF. "I have dedicated my working life to just one IBM program product — RACF," said a longtime Northrop Corp. software systems analyst. "RACF was always low-profile before. But now, it looks like it's going to be around for a long time — and so will my job."

"We want to make sure each system platform is secure so that as we distribute data to mid-range processors or workstations, the data remains secure," Vance said in an interview last week. "We want to protect the data from people who shouldn't

see it, and we also want to ensure that it doesn't get changed in flight."

SAA tie-in

Industry analysts at Gartner Group, Inc. in Stamford, Conn., expect that IBM is working on a Systems Application Architecture (SAA)-wide security strategy.

Michael Braude, a Gartner Group vice-president who specializes in software, said, "The MVS platform is just one platform, and you'd really like an SAA security facility. We believe that's what they're going to do in the early 1990s."

RACF is due for some near-term enhancements, Vance indicated. The last major enhancement came in June 1987, when RACF Version 1.8 was announced, including support for VM/XA/SP.

Vance said IBM will soon an-

ounce RACF tools and utilities that will boost the security rating from the government's C2 level to a B1 level.

"We've been investing in RACF to meet those additional functions not only in government accounts but in commercial accounts," he said. The government is evaluating IBM's B1 implementation now, he added, so that IBM can ship it to MVS and VM/XA sites by the end of the year.

Eventually, parts of RACF may be integrated into the IBM DB2 relational database manager itself — but only for administrative and planning purposes. "These [RACF] systems will need to access an administrative aspect of the repository," Vance said. "But you need a very high-speed connection for the RACF data sets that are operational, the ones that execute the security."

IBM rollouts underwhelm users

BY WILLIAM BRANDEL
CW STAFF

IBM's announcement last week of Intel Corp. 80386-based Personal System/2s and OS/2-related product rebates apparently missed the mark with corporate users. Potential customers seemed unimpressed by products and pricing but curious about the role that Officevision, the IBM announcement expected tomorrow, will play in their OS/2 plans.

IBM rolled out a PS/2 Model 55, which is based on Intel's 80386SX microprocessor, and is trying its hand with a new 21-

pound portable unit, minus the battery pack. In addition, company officials acknowledged that OS/2 is doing much worse than expected at corporate sites, sending out OS/2 distress flares in the form of rebates for OS/2-related products.

As part of the rescue, IBM announced that it would pick up the tab for its own and third-party-made products, including memory, versions of OS/2, DOS-to-OS/2 transition kits and OS/2 applications. If customers purchase any of the products before year's end, they will receive a discount, which is expected to cost IBM millions of dollars.

Hybrid outcome

The IBM PS/2 Model 55SX utilizes Intel's 80386SX and the 16-bit version of the Micro Channel Architecture bus



SOURCE: IBM

Processor: Intel 80386 SX, 16MHz
Memory: 2M bytes of random-access memory, expandable to 4M bytes on board
Bus: 16-bit Micro Channel
Graphics: Video graphics array with 256 color palette
Base price: \$3,895 with 30M byte drive
\$4,295 with 60M byte drive

CW CHART JOHN YORK

V series gets dual-processor boost

BY ROBERT MORAN
CW STAFF

Unisys Corp. last week packed more punch in its V series mainframes with a dual-processor system and signaled to its users that it will continue to enhance its proprietary lines.

Although Unisys has publicly embraced the Unix operating system, Donald Bellamy, director of processor research at International Data Corp., said, "The announcement reiterates Unisys' interest in maintaining its incompatible proprietary environments into the future."

The dual-processing system, called the Model V 560, increases the performance of the V 500 series by up to 80% and

speeds the processing of I/O-intensive applications with an additional 40K bytes of cache memory, the company said.

Seven figures

The new model is object-code-compatible with V series systems as well as B 2000, B 3000 and B 4000 systems, the company said.

The V 560 is slated to ship in August with a base price of \$2.9 million. Field upgrade kits from the previous high-end Model V 530 will cost \$1.3 million and require a \$70,000 upgrade to the new Master Control Program/V series operating system, the company said.

Peter Bauer, director of information systems at Marshfield

Clinic in Marshfield, Wis., said the company will upgrade its V 530 to a V 560 in October. "We needed the extra performance," Bauer said. "The dual processor is extremely important to us because we have to be running 24 hours a day."

The enhanced operating system automatically divides tasks between the dual processors; if either CPU goes down, the operating system will automatically assign the task to the working CPU.

Unisys has also retooled its Data Management System with a 30% performance improvement in DMS II Version 3.0, the company said. The tweaked version costs \$65,000 for a five-year leased license.

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Back in the fray

IBM's latest portable PC features the Micro Channel Architecture and a Video Graphics Array display



PS/2
Model P70 386

SOURCE: IBM

Processor: Intel 80386, 20MHz

Memory: 4M bytes of random-access memory, expandable to 8M bytes on board

Bus: 32-bit Micro Channel

Graphics: 10-inch diagonal gas plasma screen, VGA

Weight: 21 pounds

Base price: \$7,695 with 60M byte drive
\$8,295 with 120M byte drive

CW CHART JOHN YORK

the \$8,000, portable 20-MHz unit and the \$4,000 desktop Model 55. Both systems implement IBM's Micro Channel Architecture.

Insurance and finance firms, which IBM is targeting with its portable, saw little they could do with the unit, which is heavier and more expensive than most portables. "Our agents would have to do a lot of selling before they made that \$8,000 back," one MIS director said.

"I don't see any attraction to a portable without a battery pack, and our agents do not need a 386 on the road," said Rick Marolt, information resources manager at Great Central Insurance Co. in Peoria, Ill.

Users, in turn, responded apathetically to PS/2 rollouts of

curried that nickel-and-dime incentives alone will not turn a DOS shop into an OS/2 one. "Some of these are hard-hitting applications," said Nancy McSharry, senior analyst at International Data Corp., a Framingham, Mass., market research firm, "but they'll only affect users sitting on the fence."

Of the MIS sites contacted, none have standardized on 386-based systems, nor did they regard the 386SX to be a low-end starting point to 386 systems. IBM and Microsoft Corp. are both heavily promoting 386 systems, which are key to the vendors' OS/2 strategy.

Although analysts said the rebate incentive will not hurt IBM's OS/2 push, they con-

Peer-to-peer software on tap for DEC-IBM SNA shops

BY ELISABETH HORWITT
CW STAFF

CHICAGO — Systems Strategies, Inc. is expected this week to announce software that provides Digital Equipment Corp. VAXes with the full complement of IBM's peer-to-peer software — including the PU2.1 protocol that DEC still refuses to support.

Targeting hybrid DEC-IBM shops that want their VAXes to communicate over an IBM Systems Network Architecture (SNA) network, the Nynex Information Solutions Group, Inc. subsidiary will announce Ez Bridge Peer-to-Peer. The product is said to connect VAX and Decnet users to resources on IBM Application System/400s and mainframes as well as other VAXes across an IBM Advanced Peer-to-Peer Network (APPN).

The vendor is also expected to announce Ez Bridge Network Management, a tool kit for applications that manage Decnet devices from IBM's Netview. Consultants expressed restrained enthusiasm for Systems Strategies' support of APPN, an IBM protocol that provides internodal routing and connectivity for a peer network of IBM AS/400s, System/36s and 38s. "VAXes and AS/400s tend to

compete, with people going for one or the other. VAXes talk more to 370s," said Dale Kutnick, president of Westport, Conn.-based consulting company Meta Group, Inc.

However, IBM is expected to make APPN an official part of its Systems Application Architecture and to provide an OS/2 Extended Edition version of the protocol, which will make Systems Strategies' offering far more strategic, Kutnick said.

Of immediate value to users will be the first commercially available implementation of IBM's PU2.1 on a VAX, said David Passmore, a principal at research firm Network Strategies, Inc.

"People will finally be able to go peer-to-peer with VAXes," not only across APPN but also across their existing SNA backbones, Passmore said. DEC has refused to support PU2.1 because "DEC wants people to talk peer-to-peer using Decnet, not SNA," Passmore said.

The server version of Ez Bridge is priced between \$6,000 and \$20,000. Also required for the server is an intelligent communications board priced at \$6,000. The client version of the software costs between \$1,000 and \$7,000 per package.

TRENDS

Electronic data interchange

Unlike its cousin — the very hot electronic mail market — electronic data interchange (EDI) has not yet turned out to be much of a sizzler. EDI is used to automate standardized data exchange between business partners.

However, evidence that EDI awareness and activity levels are growing is detailed in a report entitled "Vertical Market EDI Directions and Potentials," from Input, Inc., a market research organization in Mountain View, Calif.

The impetus fueling EDI seems to boil down to one or two issues, regardless of industry: competitive advantage or response to customer demands.

The implication behind that pressure is clear, said Victor Wheatman, manager of Input's EDI planning program: Use EDI or you will no longer be trading with us. Several companies have stated that policy publicly, and some computer industry heavyweights, among them IBM, are moving all their customers and suppliers onto an EDI network.

Also firing up interest is the availability of micro-based EDI packages. This eliminates user security concerns about host access via the network.

Both the Input report and a study from Newton-Evans Research Co. point out a slow but steady trend in user purchasing and usage plans for EDI.

The Newton-Evans study, "Data Communications Usage Trends in Key Industries," surveyed 171 companies in six vertical markets.

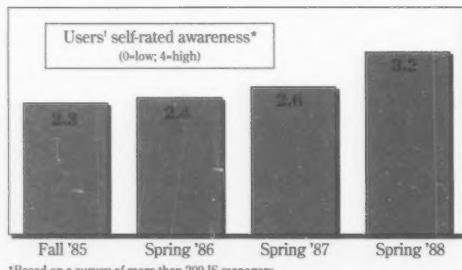
Half of the respondents, particularly those in retail/wholesale groups and financial services, reported they had no plans to use EDI. The retail response is surprising because this market sector has taken a leadership role in EDI; Newton-Evans suggested that many of its retail respondents are actually using EDI and do not realize it.

Just 20% of the respondents currently use EDI, while another 15% said they will install EDI by 1990. Most of the enthusiasm for EDI emanated from the business services and transportation industries. However, the Input report found manufacturing, distribution and transportation to be the big spenders on EDI technology.

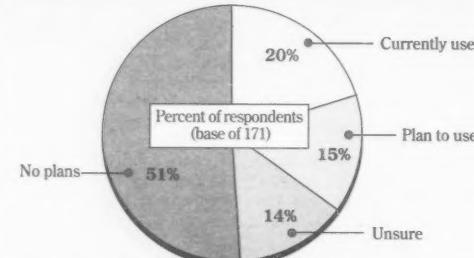
The most common applications for EDI included shipment status requests, customer order placement, billing, bank cash reporting and E-mail.

PATRICIA KEEFE

EDI awareness is growing

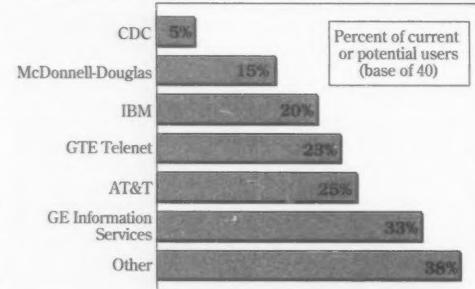


But most users are still skeptical

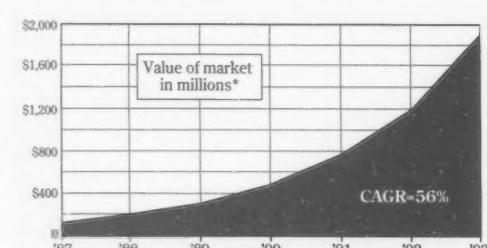


SOURCE: NEWTON-EVANS RESEARCH CO.

Users are considering several vendors



Market forecast is bright



INSIDE LINES

Windows no longer dirty? Until now, the biggest PC software vendors have naysayed Microsoft's Windows. Lotus, Ashton-Tate, Borland and Wordperfect had all opted for the memory-hogging OS/2 Presentation Manager, which continues to generate too little excitement to support even the tiniest vendor. Now some of these firms are reconsidering Windows, which is being revamped to support the so-called protected mode, which provides OS/2-style memory management. Ashton-Tate is about to decide to rewrite Dbase for Windows, and Wordperfect is strongly considering Windows. Windows holdout Lotus is "always re-evaluating," a source said.

These days, who knows? The swirling world of corporate merger rumors has come up with a new doozy: Apple Computer is interested in purchasing Cray Research. Although both Cray and Apple said they would not comment on industry speculation, one spokesman went on to note how the fit could make sense. Cray Chairman and Chief Executive Officer John A. Rollwagen already sits on the board of Apple, while both companies habitually boast about each other's products, share similar management philosophies and essentially carved out a new market before successfully exploiting it.

If you know where to look. DEC, a company that has taken great pains over the years to guard its unannounced technology, has once again left the proof in the operating system. Much like the file that users can find in VMS 5.0, DEC has hidden a list of systems, announced and unannounced, that can run with VMS 5.01. Analysts noted that the Microvax 3800 through 3880 series listed represent a new line of multiprocessing systems that DEC intends to unveil this summer. The system list can be found in the 5.01 License Unit Requirement Table.

You can see G. This week, for the first time in public, Lotus will show its graphical version of 1-2-3, code-named 1-2-3/G. The demo of a prototype (anything not in beta testing at Lotus is a prototype) will be shown at IBM's Officevision announcement. The product, along with 1-2-3/M, is a result of the IBM/Lotus joint development agreement and will be pitched as an SAA spreadsheet. Lotus will demonstrate 1-2-3/G, 1-2-3/M and 1-2-3 Release 3.0 all working together as part of an enterprise spreadsheet strategy.

Lights-out operation. Association for Systems Management members who arrived in Dallas Saturday, May 6, for ASM's 42nd Information Systems Conference were greeted by a power failure caused by severe flooding in parts of downtown Dallas. Even if attendees were willing to brave a dark walk upstairs to their Fairmont Hotel rooms, they could not check in because the hotel's reservations computer was down. ASM members were assigned for the night to other nearby hotels with electricity.

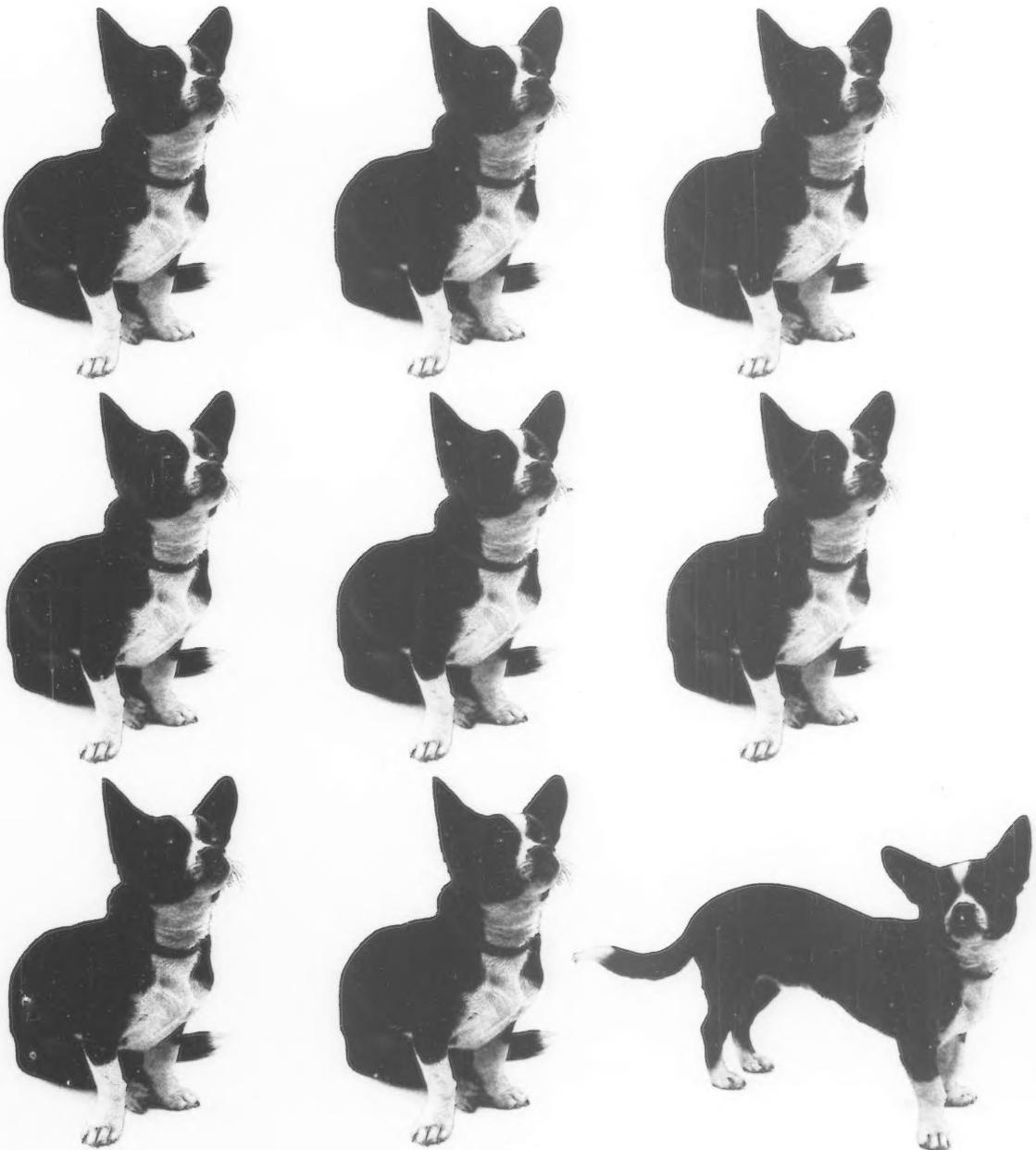
Looking for the right connection. Several micro-to-mainframe firms are expected to come out of the woodwork shortly with major product announcements. Spectrum Concepts said it will announce an OS/2 Extended Edition version of its LU6.2 communications product, XCom. Phaser Systems, which escaped Chapter 11 a couple of years ago with the help of Novell's Ray Noorda, is preparing to announce a high-speed channel-based Token-Ring gateway, among other things. Microtempus, which just enjoyed its first profitable quarter in a while, has a product and an agreement in the offing, according to Chairman Larry DeBoever. His hint: Microsoft officials spoke at the first Microtempus Users Group meeting.

Loosening up in Armonk? How else would you explain last week's item in The New York Times about IBM threatening a little Long Island company over the moniker "Big Blue"? Big Blue Products, Inc. apparently came to the attention of IBM's copyright and trademark infringement cadre and has been warned to adopt another label. If you've got reason to think IBM plans a name change, upload the info to our bulletin board at 508-626-0214, -0235 or -0165 or call News Editor Pete Bartolik at 800-343-6474 or 508-879-0700.

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